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AMERICAN

DYESTUFF REPORTER

Volume 48 January 26, 1959 Number 1

SOME PROPERTIES OF FLAMEPROOF FABRICS*

MARJORIE W SANDHOLZER

Fire Protection Section
National Bureau of Standards
Washington 25, DC

A group of five cotton and rayon fabrics were treated with seven different flame-retardant finishes. Flame resistance of the treated fabrics was determined by three different methods, before laundering and after laundering up to 14 times. Fabric strength determinations were made on the treated and untreated fabrics, before and after laundering. Several of the treatments showed good durability as affected by laundering. Commercial applications appeared to be most successful on closely woven fabrics of medium or heavy weight. In general, the treatments produced a reduction in tearing strength of the fabrics, but did not significantly affect the breaking strength.

INTRODUCTION

IN recent years, decided advances have been made in the development of durable flameproofing treatments for textiles, with the work largely directed toward meeting the needs of the military services. The treatments developed have found civilian application primarily in the field of interior furnishings in the execution of large decorating contracts, such as in hotels, theaters, and ships. Flameproofed fabrics have not been offered generally to the public at the retail level and it appeared that information regarding the effects of available treatments on fabrics suitable for clothing and other home purposes would be useful.

In the present study seven different flameproofing treatments were applied to 20- to 25-yard pieces taken from one or more of five selected fabrics. The original and flameproofed fabrics were tested for flame resistance by three different methods, for breaking strength, and for tearing strength. The fabrics were also laundered repeatedly and tested by the same methods to show the durability of the flameproofing in laundering. The materials and procedures used are described, and the results obtained are discussed in this paper.

DESCRIPTION OF FABRICS

Although a wide range in fabric type was desired for the study, preliminary contact with the finishing plants disclosed that the flameproofing treatments were considered to be applicable only to smooth-surfaced cotton or rayon fabrics weighing five oz/yd² or more. Nevertheless, one fabric of considerably lighter weight was included for trial. A description of the fabrics selected is given in Table I. The sateen, supplied by the Army Quartermaster Corps, was included as one of the fabrics which had been employed in much of the flameproofing development work, to provide a possible basis for comparision with previously obtained data.

The commercial finishing plants were not able to obtain a satisfactory application of the flameproofing in all cases, and some of the fabrics were not returned in a treated condition. The treatments applied to the various fabrics, with the add-on as calculated from fabric weight determinations, are shown in Table II. Treatments A and B were applied by the Southern Regional Research Laboratory of the U S Department of Agriculture at New Orleans. In treatment A, applied only to the sateen, the key chemical is tetrakis (hydroxymethyl) phosphonium chloride, abbreviated to THPC (*1, 2*). Treatment B was a combination formula in which the bromoform-triallyl phosphate polymer is added to the THPC formulation, the combination being designated THPC-BAP (*3*). The next four flameproofing materials were proprietary formulas applied by commercial finishers of fabrics. The probable type of each is indicated in the table. The seventh treatment, G, was the well-known borax-boric acid water-soluble flameproofing (*4*), and was applied in the laboratory by the author. The monks cloth and rayon fabric finished with treatment E would have been unacceptable commercially. They were excessively

TABLE I
Description of base fabrics

Type	*Fiber*	*Weave*	*Color*	*Weight (oz/yd²)*
Sateen	cotton	sateen	olive green	8.6
Monks cloth	cotton	basket	natural	8.1
Byrd cloth	cotton	twill	gray	4.8
Bengaline	rayon warp, cotton fill	warp-rib	rose	6.5
Dress fabric	rayon	novelty	blue	3.3

TABLE II
Flameproofing material and add-on, expressed as a percent of the base fabric weight

Designation of flameproofing treatment	*Type of flameproofing material*	*Base fabric*				
		Sateen (%)	*Monks cloth (%)*	*Byrd cloth Add-on (%)*	*Bengaline (%)*	*Rayon (%)*
A	THPC (*1, 2*)	15	—	—	—	—
B	THPC-BAP (*3*)	14	21	17	20	18
C	resin	25	34	19	21	—
D	resin	30	31	—	—	—
E	metallic oxide-chlorinated hydrocarbon	31	143	27	26	55
F	urea-phosphate	17	28	19	28	33
G	borax-boric acid	11	16	10	17	12

stiff, spotted, and the weave was distorted. The finisher did return them, however, and they were tested for flame resistance.

The most noticeable effect of the treatments was a tendency to stiffen the fabrics, the degree ranging from slight to excessive. The degree of stiffening, as determined by inspection alone, showed a rough correlation with add-on in that treatment E, with generally heavy weightings, produced generally severe stiffening, while treatment G, with comparatively light weightings, produced lightly stiffened fabrics. Otherwise, no consistent correlation was evident, either on a fabric or a treatment basis, which suggests perhaps a considerable variation in the effectiveness on different fabrics of the softening processes used. The effect of the treatments on color was slight and entirely acceptable with the neutral shades. The blue rayon and rose bengaline were more noticeably affected, but only the rose bengaline finished with treatments B and C showed objectionable change. The colors of these fabrics were lightened and, though not unattractive, appeared faded in comparison with the original.

FLAME RESISTANCE

The major criterion used for the evaluation of flame resistance was the vertical Bunsen test (5, Method 5902), which is widely used and is accepted as a standard method by various officials and organizations, including the American Society for Testing Materials and the National Fire Protection Association. The test is not a reliable criterion of fabric fire hazard under all conditions of use, however, and there is continuing interest in other methods which are proposed or may be adapted to fabric application. The group of treated fabrics offered a convenient basis for some comparison of test procedures, and flame-resistance determinations were made by two other methods in addition to the usual vertical Bunsen test. One of these was a simple match test (3), devised at the Southern Regional Research Laboratory in the course of work on the development of flame-retardant treatments, and adopted as a practical laboratory criterion which gave reproducible results. The other was a radiant panel method (6) developed at the National Bureau of Standards particularly to measure the flame-spread properties of building materials used for interior finishing purposes. The latter method was of special interest because of the wide range of flame resistance over which it might prove useful.

TABLE III
Flame resistance as determined by vertical Bunsen test

Base fabric	No. of launderings	Treatment A	B	C	D	E	F	G
Sateen	0	7.6	7.8	7.6	7.3	7.0	8.0	8.7
	1	8.0	7.9	8.2	7.8	6.7	6.6	
	14	7.7	7.4	7.9	7.7	5.8		
Monks cloth	0		9.1	8.9	8.7	9.6	9.0	10.6
	1		9.4	9.5	8.9	9.5	0.0	
	14		9.4	9.7	9.0	9.3		
Byrd cloth	0		7.3	7.1		5.6	7.8	8.1
	1		7.4	7.2		5.6	0.0	
	14		6.9	6.2		4.2		
Bengaline, warp	0		8.1	8.0		7.7	8.4	9.1
	1		8.5	8.1		6.9	0.0	
	14		8.3	5.8		5.1		
Bengaline, filling	0		7.1	7.0		5.7	8.0	8.9
	1		7.5	7.3		5.1	3.4	
	14		6.8	3.8		3.4		
Blue rayon	0		7.1			6.9	8.1	8.7
	1		7.3			5.2	0.0	
	14		7.2			0.0		

Note: Values represent average length in inches of specimen remaining uncharred.

VERTICAL BUNSEN TEST——This test consists essentially in applying a 1½″ luminous flame for 12 seconds to the lower end of a 12″ strip of fabric supported in a vertical position and clamped in a holder so that a 2″ width is exposed. Comparative flame resistance is assessed mainly on the basis of the length of the resulting charred and weakened area, which is defined as the distance from the lower end of the specimen to the end of a tear produced by raising one lower corner of the specimen to lift a prescribed weight attached to the other lower corner. The test was applied to the treated fabrics as received, and also after they had been subjected to one, three, eight and 14 launderings.

A laundering cycle judged to be reasonably comparable to home laundering was selected. It followed the procedure of the mobile laundry method for shrinkage in laundering (5, Method 5556) except that the sour was omitted and the wash load was reduced to approximately 3¼ lbs. Although little durability as affected by laundering was claimed for treatment F, it was carried through the first cycle of laundering to determine whether any flame-retardant effect might be retained. The water-soluble treatment G was not subjected to laundering. Such pressing as was required was done with a moderate hand iron.

At the selected check points in the laundering program, eight specimens (four cut in the warp direction, four in the filling direction) of most of the fabrics were tested by the vertical Bunsen Method. For the bengaline throughout, and for all of the fabrics finished with treatment E, the number of specimens was doubled, inasmuch as early results indicated a possibly significant difference in flame resistance in the warp and the filling directions. All specimens were conditioned at 65% rh and 70°F. The testing was scheduled so that two specimens (or four in the special cases noted above) of each fabric at each of two of the check points were tested in a single day. The check points were selected so that, at some time during the program, each check point had been coupled with every other in tests made on the same day. This scheduling of tests was designed to permit a statistical evaluation of the possible effects of storage over the several months of the test program and of varying ambient conditions in the test room.

The results of the vertical Bunsen tests are summarized in Table III and those obtained with treatments B and E are shown graphically in Figure 1. Inasmuch as it is usually desirable that a high value indicate good performance, the results are expressed as the average length of specimen remaining uncharred, calculated by subtraction of the measured char length from the total 12″ specimen length. Only the bengaline showed a substantial difference in warp and filling values, and this appeared to result from a difference between the warp and filling yarns in weakening ahead of the flame. The warp and filling results for the other fabrics were averaged together. Consideration of the detailed data indicated that storage and the variation in conditions in the test room had no important effect on the flame resistance results. An analysis of variance was made on a suitable portion of the data and yielded a standard deviation, s, equal to 0.5 inch for a single measurement. Applying the relation $s/\sqrt{n}$ to the average of n measurements, the standard deviation for the results shown in Table III would be approximately 0.2 inch in most cases (about 0.1 inch for the

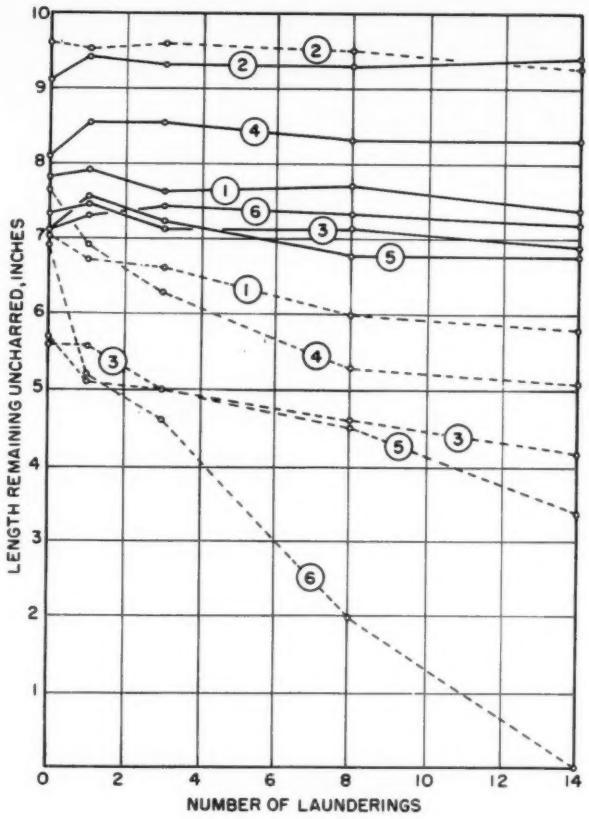

Figure 1

Relationship between flame resistance and number of launderings for treatments B (solid lines) and E (broken lines).

1—sateen
2—monks cloth
3—Byrd cloth
4—bengaline, warp
5—bengaline, filling
6—blue rayon

treatment E values except bengaline).

The results indicate that treatment G, representative of water-soluble treatments in general, provided excellent flame resistance with a lower add-on than any of the more durable treatments employed. Among the latter, treatment B was successfully applied to all of the fabrics and, with moderate add-on, provided good flame resistance which was largely retained throughout the laundering program. Treatment C also showed a fair range in application but suffered some loss in flame resistance on the bengaline and Byrd cloth after 14 launderings. Treatment D showed excellent laundering durability on the sateen and monks cloth, but its successful application was limited to two materials. With treatment E there was, in general, a progressive reduction in flame resistance with repeated laundering, the blue rayon showing almost complete loss after 14 launderings. The slight hump in the curves for treatment B (Figure 1), indicating a small temporary increase in flame resistance with the first launderings, was characteristic of all of the treatments except E. Presumably, this reflects some shrinkage and readjustment of yarns with the first laundering which, in most instances, was soon offset by a slight loss of flame-retardant chemicals.

MATCH TEST——This test uses a strip of fabric ¼″ wide by 10″ long, which is suspended vertically in a draft-free area and ignited at the lower end wtih an ordinary match. The height of flame travel is noted visually and the results are expressed by four general classifications of flame resistance: "excellent" if the fabric does not burn after removal of the igniting flame, "good" if the burning is self-extinguished in the lower three or four inches of the strip, "fair" when the burning extends approximately halfway up the strip, and "fail" when the strip burns completely.

This match test was applied to the group of treated fabrics at the same laundering checkpoints selected for the vertical Bunsen test. Six specimens (three cut in the warp direction, three in the filling direction) were used for each test, and they were subjected to the same conditioning at 65% rh and 70°F as the specimens for the Bunsen test. Average results of these tests (averaged by assigning numbers 1 to 4 to the four classifications) are shown in Table IV.

RADIANT PANEL TEST——This method incorporates a major departure from most flame-test procedures in that the unburned portion of the specimen is heated by a controlled external radiant source rather than by flames from the burning portion, which commonly waver so sevverely as to obscure the progress of flame travel. This is accomplished by supporting the 6″ x 18″ specimen in front of a vertically-mounted, preheated radiant panel, with the long dimension of the specimen at an angle of 30 degrees to the vertical, the lower end being farthest from the radiant panel. The specimen is ignited at the top by means of a pilot light. Thus, the flame front travels downward and the flames rise away

TABLE IV
Results of the match test

Base fabric	No. of launds	Treatment A	B	C	D	E	F	G
Sateen	0	fair	*ex	ex	good	good	ex	ex
	1	fail	ex	ex	good	good	fail	
	14	fail	fair	ex	good	good		
Monks cloth	0		ex	ex	good	ex	ex	ex
	1		ex	ex	fair	ex	fail	
	14		ex	ex	fair	ex		
Byrd cloth	0		good	good		good	ex	ex
	1		good	fair		good	fail	
	14		fair	fail		fair		
Bengaline	0		ex	ex		good	good	good
	1		ex	good		good	fail	
	14		good	fair		fail		
Blue rayon	0		good			ex	ex	good
	1		fair			ex	fail	
	14		fair			fail		

*Excellent

from the unignited part of the specimen. Thermocouples placed in a stack above the upper end of the specimen furnish information on the rate at which the flames would supply heat to the unignited material under normal burning conditions. Records are kept of the time of arrival of the flame front at specified distances from the upper edge of the specimen and the test is continued until the flame has travelled the full length of the specimen or until an exposure period of 15 minutes has elapsed. Results are expressed as a flame spread index, I_s, calculated as the product of the flame spread factor (F_s) and the heat evolution factor (ΔT) by the formula

$$I_s = .23\ F_s\ \Delta T$$

where .23 is a constant obtained from the thermocouple calibration curve. Large values of I_s correspond to low flame resistance and vice versa. While building materials are usually tested with a ½" asbestos millboard backing applied directly to the material under test, the fabric test specimens were prepared with a ½" air space between the fabric and the millboard backing.

The test was applied to the untreated fabrics before laundering and to the treated fabrics before laundering and after 14 launderings. Four specimens of each of the untreated fabrics were tested, and from one to three specimens were used in the treated fabrics tests. In most of the tests of the treated fabrics, ignition to produce sustained flaming did not occur. However, glow appeared on some specimens and progressed varying distances, and on some a brief surface flash travelled a short distance down the specimen. In calculating flame spread index values, the flame spread factor was based on whichever of these evidences of combustion showed the most rapid progress. When no flame, flash, or glow was present, the flame spread index was based on the heat evolution factor alone. Results of the radiant panel tests, expressed as average flame spread index values, are shown in Table V. Average values of F_s and ΔT for the untreated fabrics are included, to indicate the type of data obtained.

TABLE V
Results of radiant panel test

Base fabric	No. of launds	Treatment: None F_s	None ΔT	None I_s	A I_s	B I_s	C I_s	D I_s	E I_s
Sateen	0	31.9	46	340	1.1	1.1	2.5	5.3	2.3
	14				3.2	14.0	13.0	16.0	17.0
Monks cloth	0	48.1	84	927		23.0	3.0	33.0	4.6
	14					32.0	32.0	48.0	19.0
Byrd cloth	0	81.3	54	1013		0.5	0.7		0.2
	14					1.4	2.8		5.7
Bengaline	0	42.1	59	569		0.8	0.2		0.4
	14					3.6	4.6		29.0
Blue rayon	0	48.9	23	260		1.2			0.2
	14					62.0			264.0

TABLE VI
Tearing strength

Base fabric	No. of launds	Fabric strength: Untreated fabric (lbs)	Fabric with treatment*: A (%)	B (%)	C (%)	D (%)	E (%)	F (%)	G (%)
Sateen	0	8.2	91	66	68	71	71	73	72
	14	6.1	75	82	93	93	123		
Monks cloth	0	10.9		82	91	101		74	93
	14	15.4		62	62	81			
Byrd cloth	0	2.5		80	100		100	96	72
	14	4.3		51	70		107		
Bengaline	0	10.8		58	47		84	51	72
	14	11.2		61	48		83		
Blue rayon	0	3.7		97				159	95
	14	4.2		162					

*Strength expressed as % of that of the untreated fabric after the indicated number of launderings. Note: Tongue tear method used for all fabrics except the monks cloth and bengaline, which were tested by the trapezoid method.

COMPARISON OF TEST METHODS——The free-hanging narrow specimen of the match test provided a more severe exposure than that of the vertical Bunsen test, and the two methods differed as to criterion of flame spread. In the match test, flame travel was judged by observation of the visible flame progress, while in the Bunsen test it was gauged by the progress of a subsequently measured specified degree of fabric deterioration. The match test criterion would appear more closely related to flame spread hazard although its application was less precise, since it depended on the momentary judgment of the operator, and the classifications were approximate. In view of these differences, it is not surprising that the correlation between results by the two methods varied with the treatment, and there was no limited range of char length in the Bunsen test which corresponded consistently with a given classification in the match test. With its more severe exposure the match test appeared somewhat more sensitive than the Bunsen test in indicating degrees of flame resistance.

The radiant panel test provided comparative values over a much more extended range of flame resistance than either of the other methods, covering the untreated as well as the treated fabrics. It also supplied more detailed information on flame-spread characteristics, indicating the relative contributions of the flame-spread rate and of the amount of heat evolved to the overall flame-resistance evaluation. Thus, a rapid flame spread was the primary factor in producing the relatively high index value for untreated Byrd cloth, and a low heat output accounted for the comparatively low index value of the untreated blue rayon material. Like the match test, the radiant panel test appeared to provide a more severe exposure and give a greater resolution of the degree of flame resistance than the vertical Bunsen test. The radiant panel method has not previously been applied to fabrics, however, and additional work would be necessary to support these results and establish its value for this purpose.

FABRIC STRENGTH DETERMINATIONS

The breaking and tearing strengths of the fabrics were evaluated before and after flameproofing and after laundering one, three, eight and 14 times. In breaking strength, determined by the grab method, some of the treated fabrics appeared to show a slight initial loss, but after several launderings the breaking strength was nearly that of the laundered untreated material and it was concluded that the treatments generally had no significant effect on breaking strength. The tearing strength, however, was considerably affected in most cases.

Tearing strength determinations were made with an Instron machine, using the tongue method (5, Method

5134) for the sateen, Byrd cloth, and blue rayon materials and the trapezoid method (5, Method 5136) for the monks cloth and bengaline, for which the tongue method was not well suited. The two methods do not give comparable values, but an approximate comparison of the effects of the treatments on the different fabrics may be made on a percent basis. Table VI gives tear results before laundering and after fourteen launderings, expressed as percent of the tearing strength of the untreated fabric similarly laundered.

The effect on tearing strength varied considerably with the type of fabric. With the sateen, a marked loss in initial tearing strength generally produced by the treatments, was substantially overcome by repeated laundering, although treatment A showed a reverse effect. The Monks cloth and Byrd cloth showed decidedly lower proportionate tearing strength after laundering in most cases, which reflected a considerable increase in the tearing strength of the untreated fabric with laundering, with relatively small corresponding increases for the treated samples. The bengaline suffered generally severe reductions in initial tearing strength which were not significantly altered by laundering. Although few data were obtained on the light-weight blue rayon, it would appear that treatments B, F, and G had little adverse effect on the tearing strength of this fabric.

SUMMARY

At present, the commercial application of durable flameproofing appears to be satisfactory on a fairly restricted range of materials, although wider applicability for some experimental treatments was indicated. A general tendency of the treatments to stiffen the fabric, limits acceptability of the finish for many purposes, and it appears that certain colors are modified by treatment. Some fabrics showed a considerable reduction in tearing strength with treatment, although this effect was generally not so severe as to seriously restrict consumer acceptability, in which fabric strength is probably a less critical factor than appearance. Progress in achieving durability of flame resistance as affected by laundering has been notable, however. Thus, treatment B, applied in weightings which gave a somewhat stiffened but reasonably satisfactory finish to the entire group of fabrics studied, provided flame resistance which persisted, in large part, through a considerable laundering program. Commercially applied flameproofing also showed good laundering durability on the fabrics best suited to treatment.

With regard to the three methods used to determine flame resistance, both the match test and the radiant panel test provided a more severe exposure and appeared to give a somewhat greater resolution of the degree of flame resistance than the vertical Bunsen test. The match test offers a simple, rapid means of approximate flame resistance evaluation, well suited to checking progress in the development of new treatments, but for general use as a standard method it would require more exact definition as to test procedure and interpretation of results. The radiant panel test is a more complex method but it permits evaluation over an unusual range of flame resistance on a single scale, and separate determination of the flame spread and heat evolution factors. The tests with the present group of fabrics were not sufficient, however, to establish suitability of the method for fabric work.

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General Calendar

AMERICAN ASSOCIATION FOR TEXTILE TECHNOLOGY
Feb 4, Mar 4, Apr 1 (Della Robbia Room, Hotel Vanderbilt, New York, NY)

AMERICAN COTTON MANUFACTURERS INSTITUTE
Mar 19-21 (Annual Convention — Palm Beach Biltmore Hotel, Palm Beach, Fla)
April 15-16 (ACMI Cotton Fiber Testing Lab Open House, The Clemson House, Clemson, SC

AMERICAN OIL CHEMISTS SOCIETY
April 20-22, 1959 (Roosevelt Hotel, New Orleans, La; Sept 28-30, 1959 (Statler Hotel, Los Angeles, Calif)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, TEXTILE ENGINEERING DIVISION
March 12-13 (Annual Spring Meeting, Clemson House, Clemson, SC)

AMERICAN TEXTILE MACHINERY ASSOCIATION
May 23-27, 1960 (American Textile Machinery Exhibition, Auditorium, Atlantic City, NJ)

CANADIAN ASSOCIATION OF TEXTILE COLOURISTS AND CHEMISTS (QUEBEC SECTION)
Jan 30 (joint meeting with Textile Society of Canada Eastern Div, Ritz Carlton Hotel, Montreal); Feb 21, Mar 21, Apr 18 (McGill Univ, Montreal, Que); June 20 (Annual Golf Tournament)

CHEMICAL MARKET RESEARCH ASSOCIATION
Feb 18-19 (Meeting on textile chemicals, Dinkler Plaza Hotel, Atlanta, Ga)

DRUG, CHEMICAL AND ALLIED TRADES SECTION, NY BOARD OF TRADE
Sept 17-20 (69th Annual Meeting, Sagamore Hotel, Bolton Landing, Lake George, NY

INTER-SOCIETY COLOR COUNCIL
April 1 (28th Annual Meeting, Statler Hilton Hotel, New York, NY)

THE FIBER SOCIETY
April 29-30 (Fontana Village, NC)

KNITTING ARTS EXHIBITION
May 4-8 (Atlantic City Auditorium, Atlantic City, NJ)

MANUFACTURING CHEMISTS' ASSOCIATION
Mar 17-18 (Air and Water Pollution Abatement Conference, Netherlands Hilton Hotel, Cincinnati, O)

NATIONAL COTTON COUNCIL
Oct 7 (Chemical Finishing Conference, Mayflower Hotel, Washington, DC)

PURDUE INDUSTRIAL WASTE CONFERENCE
May 5-7 (Purdue Memorial Union Bldg, Purdue Univ, Lafayette, Ind)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES
Feb 10, March 11 (Luncheon meetings at the Hotel Roosevelt, New York, NY)

TEXTILE SUBCOMMITTEE, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
April 2-3 (1959 Conference on "Electrical Applications in the Textile Industry," Heart of Atlanta Motel, Atlanta, Ga)

Abstracts

Factors Influencing the Dyeing of Acetate Fibers with Disperse Nonionic Dyes

Fortess, F and Salvin, V S, *Textile Research J* 28, 1009-21, Dec, 1958.

A basic understanding of any textile dyeing process is concerned with those factors which influence the distribution of the dye molecules between an external phase, primarily aqueous, and the fiber phase.

Even though several hundred million pounds of textile fabrics are dyed each year with the disperse dyes, the literature concerned with their essential dyeing properties is meager, in comparison with what has been published on the mechanism of dyeing with direct dyes on rayon, vat dyes on cotton, and acid dyes on wool.

The disperse dye class was originally developed in the late '20's for secondary cellulose acetate, the first of the man-made fibers which could not be dyed with dyes of structures normally used for the natural fibers—cotton, wool, and silk. Subsequently, this class of dyes was found useful on the newer synthetic hydrophobic fibers based on the polyamide, polyester, and polyacrylonitrile structures, and more recently on the hydrophobic cellulose triacetate.

In this paper, the author discusses the following subjects:

1) The disperse dye class in terms of the chemical and physical properties of the dyes and their behavior in the aqueous and the fiber phases.

2) The influence of the percent acetylation of the cellulose upon the dyeing rate and affinity for the disperse dyes, in the range of 40-62.5% combined acetic acid.

3) The relationship of specific dye structure to dyeability and colorfastness on secondary and tricellulose acetate.

4) A discussion of the mechanism of accelerant or carrier dyeing as applied to cellulose triacetate.

While the data presented by the author do not rigorously support either the solution-dyeing or the site-dyeing hypothesis, sufficient empirical observations are presented which will increase the control and economy of dyeing with the disperse dyes.

Tables are included showing the physical properties of a number of typical disperse dyes, and the effect of chemical structure on washfastness and on the dyeing rate and affinity on secondary and triacetate fibers.

Thirteen references to the literature are cited.

A Laboratory Study of Package Dyeing (with Vat Dyes)

Woerner, P, Fordemwalt, F and Allen, E, *Textile Research J* 28, 1031-41, Dec, 1958.

Because of their outstanding fastness properties, the vat dyes have wide application in all quality dyeing fields. Their use in package dyeing of yarn has therefore assumed great importance, but some of them give level dyeings only with much difficulty.

It is known that better levelness can be obtained by circulating the unreduced vat pigment through the package before the reducing agent is added to convert the dye to the leuco form.

In dyeing by this method, the finely dispersed pigment exhausts on the fiber in the oxidized state. The degree of pigmentation varies greatly from one part of the package to another, resulting in initial unlevelness of the package. The degree of levelness of the final dyeing will depend on the amount of migration that takes place after the pigment is reduced to the leuco vat dye. Dyes having leucos with high affinity for the fiber, as is shown by measurements of the free energy of dyeing, migrate less and produce less level package dyeings.

Reducing the particle size of the pigment sometimes gives more level pigmentation at the beginning, but this is not necessarily reflected in more level final dyeings. The vat-acid process also leads to more uniform pigmentation, but still does not give level dyeings in every case; it is also quite inconvenient. Retarding agents promote levelness by slowing up the strike, but are uneconomical because much dye is left in the bath. Solvents slow the rate of dyeing and promote levelness, but also interfere with exhaustion and are very expensive. A higher temperature (212-220°F) during the pigmentation and reduction shifts the equilibrium in favor of the dyebath and promotes levelness; the temperature can then be lowered to put the remaining dye on the fiber. However, pressure machines are necessary; also, many dyes are unstable at the higher temperatures.

A migration test for vat dyes, in which a dyed and an undyed skein are placed in a caustic-hydro solution and allowed to reach equilibrium, has been found to give a good indication of the dye's leveling ability.

Nine references to the literature are cited.

Pilling: What Can Be Done About It

Brickenden, E K, *Textile Inds* 122, 96, Dec, 1958.

There are a number of important factors in pilling, from which practical and effective control measures may be developed. They are listed under four headings:

Fiber. The pilling tendency decreases as the fiber denier increases. The higher the fiber tenacity, the greater is the pilling effect.

Yarn. Pilling control can be achieved by using the finest yarn count permissible. Plied yarns pill less than single yarns. Adequate twist is important. Yarn hairiness increases the pilling tendency.

Fabric. Loose structures pill more than firm structures. Long floats require extra control measures.

Finishing. Brushing, shearing and singeing are extremely effective in preventing pilling. Thermoplastic fibers that have been heat-set are less likely to develop the trouble. Some resins have been used to prevent pilling, but at the expense of the fabric hand.

Three basic prevention methods are suggested:

1) Use of fibers that are difficult to deform and entangle.

2) Use of constructions that minimize the "teasing out" of fibers.

3) Removal of surface fibers by effective finishing operations.

Protect Wool in Process

Laudani, H, Langlais, G O, and White, F E, *Textile Inds* 122, 69-71, 119, 123, December, 1958.

Wool is constantly in danger of being attacked by insects from the time it is shorn to the time when the product is discarded.

Very little protection is provided unfinished wool while it is in storage. An effective, low-cost treatment is badly needed.

The authors propose the use of a nonionic emulsifiable concentrate, entitled "EQ-53," consisting of 25% DDT, 10% Triton X-100, and 65% Solvesso 100. This emulsion is added to the final rinse bowl of a four-bowl scouring train.

The authors have found that DDT shows a marked substantivity for wool when applied in this manner. The level of the DDT residue on the wool can be controlled by the amount of emulsion used. An application as low as ¼ oz of EQ-53 per lb of wool makes the wool immune to insect damage from the scouring to the knitting yarn stage, it is said.

The authors also suggest the possibility of introducing EQ-53 in the backwashing, bluing, or any other process involving water; also of introducing DDT into the stock with the wool oil.

Seven references to the literature are cited.

Creslan

Anon, *Textile Bull* **84**, 91-2, September, 1958.

Creslan acrylic fiber is a development of the American Cyanamid Co. Commercial production was expected to commence late in 1958.

This new fiber is said to offer the advantages of less costly processing and superior dyeability. It has affinity for a large number of dye classes, and can be dyed in a full range of colors, which are said to have superior fastness to light, washing, crocking and perspiration.

The fiber has a tenacity of 3.0-3.5 gpd. It is not affected by prolonged light exposure. It resists drycleaning solvents, weak mineral acids, and strong organic acids, but not strong alkalis. It is wrinkle-resistant and dimensionally stable and is unaffected by moths and mildew.

Blends with other fibers can frequently be piece-dyed to achieve the effects of stock or yarn dyeing.

Anticipated applications include men's and women's suitings, knitwear, hosiery, carpets, work clothing and industrial fabrics.

Tricel Succeeds for Industrials and Fillings

Anon, *Man-made Textiles* **35**, 84-6, June, 1958.

Tricel (cellulose acetate) has a tenacity of 1.2 gpd and an extension of about 30 percent. Among its more important properties which can be utilized for industrial fabrics are good resistance to heat, moisture and bacteria. For example, when heated to temperatures which completely degrade cotton, Tricel fabrics are still serviceable. The fiber will resist both dry and moist heat. This property makes it suitable for laundry press cloths and electrical tapes. Tricel fabric has also been used successfully as a back cloth in a festoon steamer, replacing cotton, which is degraded at the working temperature of the steamer (216-30°F).

Tricel has good resistance to many chemicals, including dil sulfuric and hydrochloric acids (but not nitric acid). It is attacked by strong alkalis. Its behavior in organic solvents varies; eg, it is soluble in chloroform and glacial acetic acid; is swollen by acetone and trichlorethylene; and is unaffected by carbon tetrachloride and perchlorethylene.

Burial tests have proved that Tricel is resistant to rotting and fungicidal attack. While cotton is destroyed within a few days, triacetate fibers show no significant damage after 12 weeks.

Tricel is now being successfully used as a filling material, particularly for quilts and quilted garments. It is a very good heat insulator, is light, soft, resilient and hygienic. Moths do not attack it. Cot quilts containing a Tricel wadding are fully washable.

For the production of carded battings, Tricel is supplied in baled fiber form.

Both 100% Tricel and blends with polyester fiber are now being used in laundries, it is stated.

Tricel has an exceptionally high electrical resistance. Among substances capable of being used as textile materials, cellulose triacetate is only excelled in electrical resistance by polyester fibers, polyethylene and glass.

What Affects Chlorine Retention in Resin-finished Cottons

Mosher, H H, *Textile World* **108**, 95-7, Dec, 1958.

The cyclic-urea resins are less troublesome as regards chlorine retention than the more commonly used resins, and theoretically should be completely free of this fault, but in practical application small amounts of chlorine do react with the nitrogen to form chloramides. Poor curing, insufficient catalyst, lack of afterwashing, steaming, or even storage may tend to cause a small amount of hydrolysis that leaves the nitrogen open to react with chlorine. However, the cyclic-urea resins are basically satisfactory as regards chlorine retention when they are properly handled.

Chlorine retention can be materially reduced if sufficient amounts of the right catalyst are used in the bath, and if a complete curing is followed by an alkaline afterwash.

Magnesium chloride and zinc nitrate are most preferred to get initial chlorine resistance and a thorough cure. These compounds produce residues of metallic oxides and carbonates that help buffer the goods against acid damage, at least in the first few launderings.

Even the best resins properly applied may be affected by improper storage, residual acid, steaming, or even sunlight. Residual acidity is the major factor in the degradation of resin finishes and in most cases is a result of not afterwashing the fabrics after they have been cured. The damage done by small amounts of acid left in the goods may not be apparent for weeks or months after the goods have been processed. Bad odor and susceptibility to chlorine damage in laundering are the usual results of acid left in resin-treated goods.

The author cautions that resin-finished fabrics are sometimes steamed as a prelude to calendering or shrinkage control. He states that it has been found that steam can unblock the amide radicals in a cured cyclic-urea resin within a few seconds, and thus leave it more open to chlorine attack in laundering.

Some Advantages of Cotton/Rayon 80x80 Print Cloth

Lund, G V, Papers of AATT, *Modern Textiles* **39**, 69-75, June, 1958.

Cotton/rayon blends have a number of advantages over all-cotton fabrics, which the author lists as follows:

1) They are generally more economical, due to lower raw material cost and less waste.

2) The yarns are more uniform.

3) Yarns and fabrics are more lustrous, approaching mercerized cotton in this respect.

4) Brighter colors and often better colorfastness are obtained.

5) The hand is softer and the drape is improved.

6) The fabrics are whiter and require less severe bleaching.

In addition, cotton is damaged by acid catalysis and embrittled by resins (in creaseproofing), and is easily tendered by chlorine retention. Rayon is less sensitive in all these respects.

The physical properties (tensile and tear strength and flex abrasion resistance, both wet and dry) of 80-80 print cloth composed of cotton, rayon, and blends of these fibers are given by the author after desizing and bleaching and also after treatment with Aerotex Resins EU and MW at various concentrations. At a given resin content, rayon gives lower crease resistance but better dry tensile strength than cotton, with blended fabrics intermediate in behavior. The wet tensile strength after resin treatment does not vary greatly between cotton, rayon and the blends. A cotton/rayon (75:25) blended fabric with 6.5% resin has crease resistance equivalent to cotton with 5% resin, and the blend has better dry tensile strength, slightly higher water absorption, and only very slightly lower wet tensile and tear strength than 100% cotton.

The author states that it has been found that, for a given resin, rayon and blends of cotton and rayon suffer considerably less damage from chlorine retention than does cotton alone.

• PATENT DIGEST •

PAUL WENGRAF

Stable Mechanical Finishing Effects———Impregnating with special aminoplast mixtures G,4

U S Pat 2,819,179 (Am Cyanamid Co——Barnard, Growney——Jan 7, 1958)

Various resinous compositions have been advocated for the purpose of producing durable calender finishes by impregnating with resin precondensates, drying, embossing and curing. The current specification points up the disadvantages experienced in these methods, eg, an undesired build up of the condensates on the calender rolls and engraved portions, losses in tear strength, extremely firm hand of the fabrics, etc.

An improved method by which textile fabrics may be mechanically finished with great durability of effect, including higher water repellency and excellent retention of the original tear strength, reportedly is provided by impregnating with a composition containing a) a heat-reactive, water-dispersible aminoplast, such as *non-alkylated* methylolmelamine, methylolurea, etc; b) a lower alkylated methylol melamine; and c) a higher acid amide or N-alkylol acid amide.

Relative to "a", a broad variety of heat-reactive, water-soluble, resin-forming aminoplasts can be used. Among the numerous derivatives of melamine, urea, amides, etc, the examples mention dimethylol ethyleneurea, dimethylolmelamine, and mixed mono- and dimethylolureas.

Relative to "b", methylated methylolmelamines are preferred over the ethylated or butylated compounds by reason of their good water solubility. Best results have been obtained with a mixture containing essentially dimethylated trimethylolmelamine.

Examples of component "c" include the higher acid amides, such as caprylamide or stearamide and, preferably, the N-alkylol derivatives thereof, particularly N - methylol stearamide.

Mixtures of "b" and "c" are described for other purposes in U S Pat 2,357,273 (Am Cyanamid/Thurston) and 2,491,249 (Am Cyanamid/Cathers et al). It has not been determined yet whether a reaction between "b" and "c" occurs.

The preferred ratio of "b" to "c" may be between 1:0.5 and 1:1.5. In the preparation of the impregnating bath, 50 to 150 p of the mixture "b" plus "c" on 100 p of "a" are applied. The concentration of the bath must be adjusted to a pick up of 2-10% solids based on the dry weight of the goods. Then the goods are best dried to a moisture content of 6-12%. The treatment is applicable for cotton fabrics which are to be glazed or embossed as well as to other fabrics which contain natural or synthetic fibers. After mechanical finishing, the material must be dried at lower temperatures and cured.

A table (col 5 and 6, lines 4-22) presents figures on gloss, tear strength, and spray ratings of finished goods treated with aminoplasts (a) alone as compared with results obtained according to the patented method (a+b+c). Effects resulting from the latter process proved to be superior in every respect.

Among the references cited by the Patent Office:

U S Pat 2,284,609 (Am Cyanamid/1942) covers a method of crease- or shrinkproofing with mixtures of melamine-formaldehyde plus N-ethanol stearamide.

U S Pat 2,491,249 (Am Cyanamid/1949 covers a water-repellent composition containing methylated methylolmelamine and stearamide in dispersion [cf *Am Dyestuff Reptr* 39, 267 (1950)].

U S Pat 2,504,857 (Bancroft & Sons/1950) describes a method of creaseproofing, which calls for the application of aqueous mixtures of methylated and nonmethylated methylolmelamines, drying and curing [cf *Am Dyestuff Reptr* 39, 524 (1950)].

U S Pat 2,622,994-5 (Bancroft & Sons/1952): durable calender effects are said to be obtained by impregnating with a solution of an acid-catalyzable thermosetting resin, drying to low moisture content, cooling, calendering, and curing [cf *Am Dyestuff Reptr* 42, 848 (1953)].

U S Pat 2,690,404 (Dan River Mills/1954): obtaining wrinkle-resistant cellulosic fabrics by impregnating with a mixture of polymethylolmelamine and dimethylolethyleneurea and curing [cf *Am Dyestuff Reptr* 45, 148 (1956)].

Shrinkproofing of Wool——Combination of epoxy resins and polyalkyleneimines A,2,04

U S Pat 2,817,602 (Secy Agric——Pardo Jr——Dec 24, 1957)

Epoxy resins and polyalkyleneimines are believed to react with the protein molecule during the impregnating, drying and curing operations. It has been observed that, after the curing operation, they can no longer be removed by hot washing or laundering procedures.

Polyethyleneimine is, in this case, the preferable polyalkyleneimine; others which might be employed are polymers of propyleneimine, of 1-2-butyleneimine, etc.

Any of the known resins containing epoxy radicals can be used. A well-known product is the condensate of epichlorohydrin with a polyalcohol, such as glycerine, or with a phenol. A preferred compound is prepared by condensing epichlorohydrin with bis (p-hydroxy-phenyl) propane.

Example: A commercial epoxy resin, eg, that obtained from epichlorohydrin and bis(p-hydroxyphenyl propane), is added to a dilute solution of polyethyleneimine and homogenized therein. Emulsification may be assisted by applying Triton X-100 (octylphenylether of polyethylene glycol). After wool swatches are padded to a wet pick-up of 100%, dried at 50° C, and cured for one hour at 100° C, very stable shrinkproofing effects are reported, especially when ratios of polyethyleneimine-to-resin between 2:1 to 5:1 are utilized.

Among the references cited by the Patent Office:

U S Pat 2,553,696 (Union Carbide/1951) describes the preparation of water-soluble polymers of lower alkyleneimines.

U S Pat 2,723,924 (Union Carbide/1953) covers a method for shrinkproofing wool by a treatment with a water-soluble resinous condensate of polyalkylenepolyamines and an aryl-polyepoxy compound.

Proceedings of the

American Association of Textile Chemists and Colorists

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37th National Convention———

NONIONIC DETERGENTS IN RAW-WOOL SCOURING INCLUDING STUDIES OF WASTE CLARIFICATION*

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Several types of nonionic detergent, representing polyethylene glycol derivatives and alkylolamides, were compared in laboratory studies of raw-wool scouring. Scouring effectiveness was measured at various pH's. Acid and bentonite treatments were tested for effectiveness of coagulation of wastes derived from detergent scouring and from desuinting and suint scouring. Residual detergent was determined in the scouring effluents before and after clarification.

Among polyethylene glycol derivatives, the alkylpolyoxyethylene ethers were uniquely effective under acid scouring conditions. They showed excellent cleaning effectiveness and low detergent consumption independent of pH over a range of 4 to 10. However, in common with other polyethylene glycol derivatives, the waste liquors produced were exceedingly difficult to clarify.

On the other hand, alkylolamides, particularly those containing a high proportion of dihydroxyethyl lauramide, exhibited the dual advantages of excellent neutral scouring efficiency and uniquely effective waste liquor clarification by simple cold acid-cracking.

In contrast to wastes derived from detergent scouring, wastes from desuinting and suint scouring are effectively clarified by bentonite treatment without acidification.

INTRODUCTION

SCOURING of raw wool with nonionic synthetic detergents of the alkylphenol ethylene oxide type under neutral conditions has gained wide acceptance over conventional soap and soda scouring in this country in recent years (*1, 2, 3*). The technical advantages of these nonionics include superior grease-emulsifying properties, lower detergent adsorption by wool, lower heat consumption in drying of the scoured stock, and milder scouring conditions, resulting in less fiber damage. Wools scoured by the neutral nonionic process are superior in color, possess a loftier hand, and exhibit reduced fiber breakage in subsequent mechanical processing, as compared with wool scoured in alkaline solutions.

A well-recognized disadvantage of nonionic detergents is that they yield very stable grease emulsions, which are relatively difficult to clarify by conventional acid-cracking procedures (*4*). This drawback is an important consideration in the acceptance of nonionic scouring, particularly where stream-pollution regulations are in force, since wool-scouring wastes are among the most offensive types of textile waste (*5*).

In the past, raw-wool scouring procedures have been developed primarily on the basis of effective and economic scouring with minimum loss in wool-fiber quality. Little attention has been given to byproduct recovery or effluent clarification. However, growing public awareness of the urgency of stream-pollution control dictates the need for considering alternative wool-scouring methods which combine effective cleansing with production of a waste which can be readily clarified by simple physical or chemical treatment.

This paper presents results of a laboratory study of the scouring effectiveness under varied pH conditions of several selected nonionic detergents of the polyethylene glycol and alkylolamide types and the coagulation behavior of the resultant wastes on treatment with bentonite and acid. In some instances the clarified waste was analyzed for residual detergent in order to determine the feasibility of recycling to the scouring process. Data are also presented on the treatment of wastes which result from desuinting, an optional water-steeping operation commonly carried out in the first bowl of a scouring set to remove water-soluble suint and dirt before detergent-scouring in subsequent bowls, and from scouring with clarified suint solutions.

EXPERIMENTAL

SCOURING———The comparative effectiveness of various detergent formulations was determined by a cumulative scouring procedure similar to the AATCC Standard Test Method 64-1952 (*6*). For scouring trials under neutral conditions, six successive 10-gram samples of a standard grease wool were passed through a series of three bowls, the first containing 400 ml of a 0.1% solution of the detergent tested, the second containing 400 ml of a 0.05% solution of the detergent tested, and the third 400 ml of water for rinsing. The temperature in all bowls was maintained at 65°C and the time of scouring in each bowl was two minutes.

For scouring trials under acid conditions, the same procedure was followed, except that 0.1% acetic acid was added to the first and second bowls. For scouring trials under alkaline conditions, 0.2% sodium carbonate was added to the first bowl and 0.1% sodium carbonate to the second bowl. Alkaline scouring was carried out at 55°C.

*Presented October 31, 1958 at the Conrad Hilton Hotel, Chicago, Ill, during the 37th National Convention.

**A laboratory of the Western Utilization Research and Development Division, Agricultural Research Service, US Department of Agriculture.

In order to simulate the common commercial practice of using the first bowl of a scouring train for desuinting, each 10-gram sample of grease wool was steeped in water at room temperature before scouring. The wool used in this study was a well-blended lot of California-grown fine wool with a grease content of 12.4%, a suint content of 11.8%, and dirt content of 10.3%. The residual-grease content of the scoured wool samples was determined by Soxhlet extraction of the air-dried wool with carbon tetrachloride.

WASTE TREATMENT——The waste scouring liquor from the first bowl only, which contained the highest concentration of grease and dirt, was used in the waste-treatment experiments. The waste liquor was allowed to stand for about 15 minutes to allow the heavier dirt particles to settle out before decanting off samples for waste treatment. Treatments of 100-ml portions were carried out by various experimental procedures. The treated waste was allowed to sediment by gravity for one hour to separate the precipitated sludge before decanting off the clarified supernatant for analysis. The effectiveness of the various treatments was evaluated by determining the residual grease content, total solids, and in some instances chemical oxygen demand (COD) and total nitrogen (*7*).

DETERGENT ANALYSIS—— For several selected nonionic detergents of the polyethylene glycol type, quantitative analyses were carried out for the residual detergent in the scouring wastes before and after treatment. Before analysis for residual detergent, it was necessary to remove interfering suspended dirt and grease carrying bound detergent. Clarification was accomplished by centrifuging in a Spinco ultracentrifuge at 50,470 rpm (average centrifugal field 150,000 g) for approximately 10 minutes using a preparative rotor. After centrifuging, the samples were essentially clear and pale yellow. Under the conditions used, sedimentation of the free nonionic detergent in solution was negligible.

The choice of a satisfactory method for determining residual nonionic detergent in the clarified scouring wastes presented considerable difficulty. In the case of alkylphenol ethylene oxide condensates, which have an absorption peak at 275 millimicrons, analysis was attempted by UV spectrophotometry. However, the scouring waste contained UV-absorbing substances (probably from water-soluble suint carried over by the desuinted wool into the scouring solution and from soluble protein degradation products) which interfered in the analysis. Similarly, a colorimetric procedure based on precipitation of the nonionic detergent with phosphomolybdic acid proved unsatisfactory because of the simultaneous precipitation of other components, presumably protein, present in the waste solution.

The method finally found to be applicable was that of Brown and Hayes (*8*) based upon the formation of a blue complex between polyethylene glycol derivatives with ammonium cobaltothiocyanate. This complex is extractable with chloroform to give a blue solution which can be analyzed spectrometrically. The chloroform extract has a strong absorption peak at 318.5 millimicrons and a weaker peak at 620 millimicrons. For this investigation the weaker absorption was employed because other substances extracted from the waste scouring solutions interfered with measurements at 318.5 millimicrons.

The absorbance measurements were carried out with a Beckman DU spectrophotometer. For each type of polyethylene glycol condensate studied, a separate calibration curve was prepared by analysis of solutions of known concentration from which the concentration of an unknown solution could be determined.

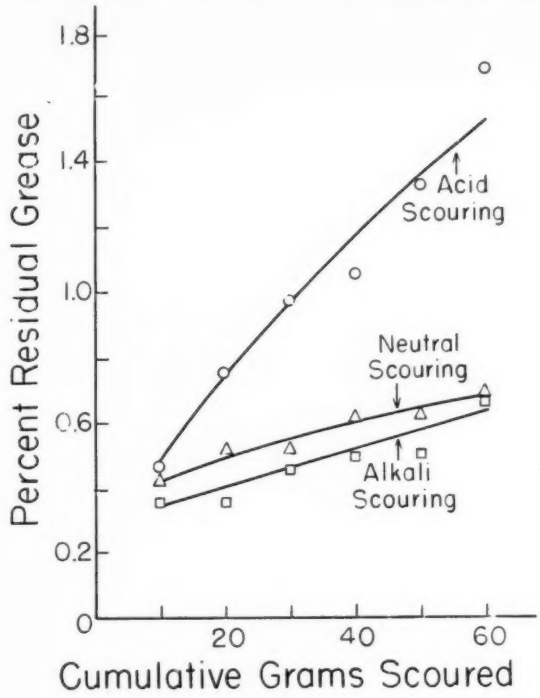

Figure 1
Scouring efficiency of Surfactant A under alkaline, neutral and acid scouring conditions

RESULTS AND DISCUSSION

POLYETHYLENE GLYCOL SURFACTANTS —— Previous work at this laboratory (*9*) has shown that dispersible bentonite is an effective coagulant for scouring wastes under acid conditions. Since treatment with bentonite does not introduce undesirable contaminants into the clarified solution as would conventional chemical coagulants such as calcium chloride, ferric sulfate, and alum, there is a possibility of recycling the clarified effluent to the scouring operation. Such a procedure would be particularly adaptable to waste from the scouring of wool under acid conditions. In this case it would be unnecessary to acidify the waste before treatment or to neutralize the clarified effluent before reuse.

In order to explore the feasibility of reusing bentonite-clarified waste, scouring experiments under various pH conditions were carried out with the following three polyoxyethylene-

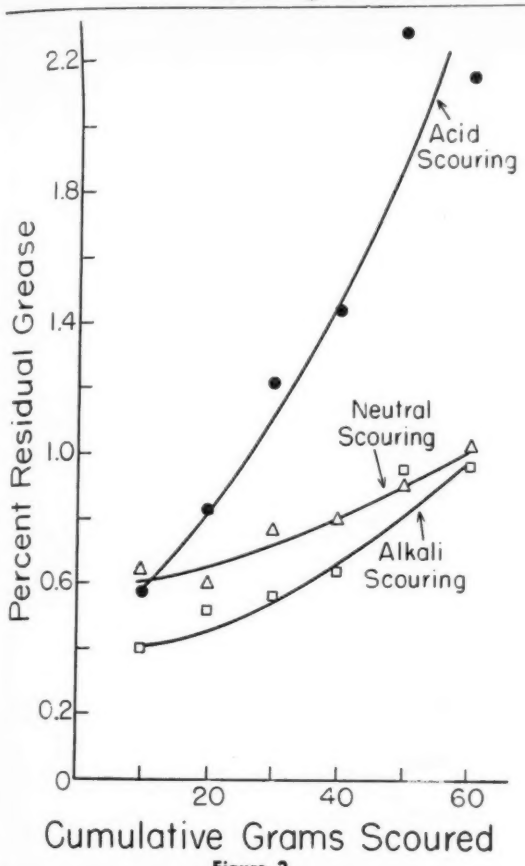

Figure 2
Scouring efficiency of Surfactant B under alkaline, neutral and acid scouring conditions

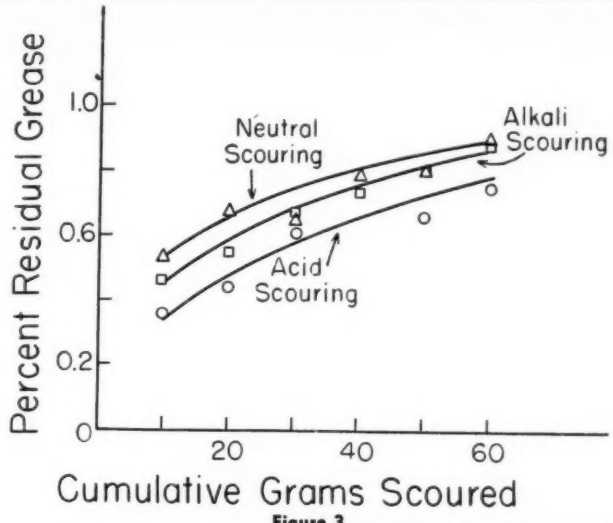

Figure 3
Scouring efficiency of Surfactant C under alkaline, neutral and acid scouring conditions

type surfactants: Surfactant A, an alkylaryl polyoxyethylene ether; Surfactant B, polyoxyethylene esters of mixed fatty and rosin acids; and Surfactant C, a lauryl polyoxyethylene ether.

The results of the cumulative scouring trials with Surfactant A, shown plotted in Figure 1, indicate that the scouring efficiency of this material is considerably poorer under acid conditions than under either neutral or alkaline conditions. Similarly, in the case of Surfactant B there is a very marked decrease in scouring efficiency under acid conditions. In contrast, the data for Surfactant C, shown plotted in Figure 3, indicate that the scouring efficiency of this material is almost equally effective under acid, neutral and alkaline scouring conditions. The observed behavior of Surfactant C in acid scouring baths is in agreement with the use of similar types of nonionic surfactants made by reacting fatty alcohols with ethylene oxide for the isoelectric scouring of grease wool (*10*).

Table I summarizes the analytical data for treatment of waste from the scouring trials with the three surfactants. The treatments investigated included addition of bentonite alone, of acetic acid alone (in an amount sufficient to give a final pH of 5), and of bentonite with acetic acid to give a pH of 5. The treatment with acetic acid at pH 5 was selected because it represents the desired pH level for isoelectric scouring of wool. In all cases the treatments were carried out at the temperature of scouring.

The percent of grease removal, based on the grease content of the waste effluent taken for treatment, was used as the main criterion for comparing effectiveness of various waste clarification methods. Treatment of the wastes from neutral and alkaline scouring with bentonite was totally ineffective. Direct treatment of waste from acid scouring with bentonite at pH 6.2 was particularly effective with Surfactant B, of intermediate effectiveness with Surfactant A, and quite poor with Surfactant C. It is interesting to note that the poorer the scouring effectiveness under acid conditions, the more amenable the waste is to clarification with bentonite.

In all cases, acidifying the waste with acetic acid alone was extremely ineffective. For all three surfactants, treatment of the waste samples with

TABLE I

Analytical results of treating scouring waste with acid and bentonite

Scouring procedure	Treatment	pH	Grease content of treated waste[a] Surfactant A[b]	Surfactant B[c]	Surfactant C[d]
Neutral	none	7.4–7.5	8,600 (..)	8,480 (..)	9,750 (..)
Neutral	0.1% bentonite	7.3–7.5	7,700 (10)	7,610 (10)	9,420 (3)
Neutral	acetic acid	4.9–5.1	7,050 (19)	7,600 (10)	9,300 (5)
Neutral	acetic plus 0.1% bentonite	4.9–5.2	3,550 (59)	2,600 (70)	4,460 (54)
Acid	none	6.2–6.4	10,900 (..)	7,380 (..)	7,850 (..)
Acid	0.1% bentonite	6.1–6.4	5,420 (49)	1,520 (80)	5,650 (28)
Acid	acetic acid	4.9–5.1	—	6,500 (12)	7,900 (0)
Acid	acetic plus 0.1% bentonite	4.9–5.1	3,280 (69)	2,000 (73)	2,700 (65)
Alkali	none	9.1–9.2	10,900 (..)	9,400 (..)	8,950 (..)
Alkali	0.1% bentonite	9.1–9.2	8,950 (18)	7,550 (13)	8,900 (0)
Alkali	acetic acid	4.9–5.2	8,440 (23)	6,900 (27)	7,470 (19)
Alkali	acetic plus 0.1% bentonite	4.9–5.2	7,080 (35)	5,100 (46)	6,000 (37)

[a] Grease in ppm remaining in treated effluent. Percentage removed from effluent in parentheses.
[b] Alkylaryl polyoxyethylene ether.
[c] Polyoxyethylene esters of mixed fatty and rosin acids.
[d] Lauryl polyoxyethylene ether.

acid and bentonite together resulted in relatively high grease removal from the neutral and acid scouring samples and somewhat lower removal from the alkaline scouring samples.

Although the scouring effectiveness of Surfactant C under acid conditions appears acceptable and treatment of the resultant waste with acid and bentonite at pH 5 provides adequate clarification, analysis of the treated waste for residual surfactant (Table II) shows that 61% of the potentially recoverable surfactant in the untreated scouring waste is removed by the combination treatment. This rather large loss of surfactant in clarification makes the possible reuse of the clarified effluent for further scouring somewhat unattractive. With each of the three surfactants included in this investigation, addition of bentonite alone or acid alone results in substantial removal of surfactant from the clarified effluent. The combination treatment gives a proportionally higher removal.

The residual surfactant concentration of the various untreated spent scouring samples affords a means of comparing relative detergent consumption under various pH conditions. The consumption of Surfactant C in scouring is approximately the same under alkaline, neutral, and acid scouring conditions. On the other hand, consumption of Surfactants A and B increases considerably under acid conditions. These results are in accord with the superior scouring effectiveness of Surfactant C under acid conditions. The consumption of Surfactant B under neutral and alkaline conditions is significantly lower than for Surfactants A and C, in spite of the fact that all three surfactants were approximately equally effective in neutral and alkaline scouring.

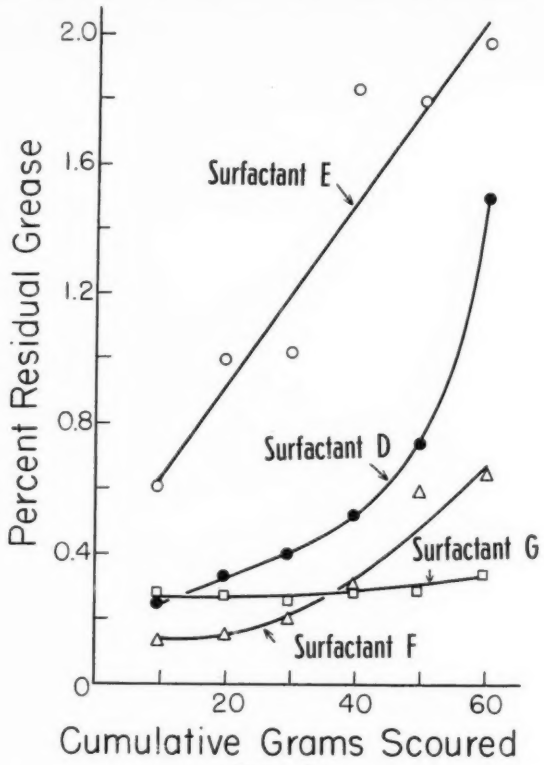

Figure 4
Scouring effectiveness of various alkylolamide surfactants under neutral scouring conditions

ALKYLOLAMIDE SURFACTANTS——Another phase of this investigation was concerned with the scouring effectiveness of alkylolamide surfactants and the relative ease of clarifying the resultant wastes.

The alkylolamide class of surfactants comprises essentially nonionic products obtained by reaction of fatty acids with an alkylolamine. Water-soluble derivatives of commercial importance, known as the 2:1 type, are obtained by reaction of one mole of coconut fatty acid or lauric acid with two moles of diethanolamine. The latter reactant is therefore in excess. Recently, high-purity alkylolamides produced by ester-exchange techniques have been introduced (*11, 12*). These products, known as the 1:1 type, are much less soluble than the 2:1 type and contain a true amide content of over 90% compared with an amide content of 40% to 60% for the 2:1 type. The most important commercial application of these materials is in foam stabilization of alkylaryl sulfonate formulations (*13*). However, the alkylolamides are in themselves excellent detergents (*14*).

The scouring effectiveness of the following alkylolamide surfactants was measured: Surfactant D, diethanolamine-coconut fatty acid condensate; Surfactant E, fatty alkylolamide; Surfactant F, 2:1 type diethanolamine-lauric acid condensate containing 49% dihydroxyethyl lauramide; and Surfactant G, 1:1 type containing 90% dihydroxyethyl lauramide (*15*). Scouring trials were carried out under neutral conditions without addition of alkali other than that present in the product as unreacted alkanolamine.

As shown in Figure 4, the scouring

TABLE II

Analytical data on residual surfactant content of treated scouring waste

Scouring procedure	*Treatment*	*Surfactant content of treated waste*[a] *Surfactant A*[b]	*Surfactant B*[c]	*Surfactant C*[d]
Neutral	none	0.060 (..)	0.086 (..)	0.063 (..)
Neutral	0.1% bentonite	0.046 (23)	0.054 (37)	0.040 (37)
Neutral	acetic acid	0.046 (23)	0.069 (20)	0.053 (16)
Neutral	acetic plus 0.1% bentonite	0.024 (60)	0.048 (44)	0.032 (49)
Acid	none	0.034 (..)	0.064 (..)	0.066 (..)
Acid	0.1% bentonite	0.020 (41)	0.036 (44)	0.037 (44)
Acid	acetic acid	—	0.044 (31)	0.066 (0)
Acid	acetic plus 0.1% bentonite	0.019 (44)	0.038 (41)	0.026 (61)
Alkali	none	0.050 (..)	0.074 (..)	0.066 (..)
Alkali	0.1% bentonite	0.030 (40)	0.051 (31)	0.046 (30)
Alkali	acetic acid	0.031 (38)	0.066 (11)	0.053 (20)
Alkali	acetic plus 0.1% bentonite	0.019 (62)	0.030 (60)	0.026 (61)

[a] Surfactant in percent remaining in treated waste. Percentage removed from effluent in parentheses.
[b] Alkylaryl polyoxyethylene ether.
[c] Polyoxyethylene esters of mixed fatty and rosin acids.
[d] Lauryl polyoxyethylene ether.

effectiveness of the various alkylolamide products varied considerably. Surfactants D and E were relatively ineffective. Surfactant F is about as effective as a typical polyethylene glycol type surfactant under neutral scouring conditions. Surfactant G appears somewhat more effective. The excellent scouring effectiveness of Surfactant G was rather unexpected in view of the very limited water solubility of this material.

Our results indicate that the more effective alkylolamide surfactants are those derived from lauric acid and diethanolamine, and particularly those products containing a high content of dihydroxyethyl lauramide. Several higher fatty-acid—alkylolamine condensates of the 2:1 type, including capric, oleic and stearic diethanolamides, were evaluated for scouring effectiveness and found to be extremely poor.

Comparative scouring results with Surfactant F under alkaline conditions and under neutral conditions with the addition of sodium sulfate showed a beneficial effect of building with alkali or with neutral electrolyte. Scouring with alkylolamide surfactants under acid conditions is totally ineffective.

The wastes from neutral scouring with the alkylolamide surfactants were subjected to clarification by treatment with bentonite and by acid-cracking with sulfuric acid at 65°C and at 25°C to a pH level of 3.0—3.3. For comparative purposes, wastes from conventional neutral nonionic scouring with an alkylaryl polyethylene glycol surfactant (Surfactant H) and from alkali scouring with sodium oleate were treated by the same procedures.

The waste treatment results, summarized in Table III, show that in general the alkylolamide scouring wastes are easier to clarify than conventional neutral nonionic scouring wastes. They are comparable to soap-and-soda-ash waste in clarifying behavior. A very significant result was the uniquely effective grease removal obtained by cold acid-cracking of the alkylolamide wastes, particularly the Surfactant D and Surfactant F samples, which showed essentially complete grease removal producing resultant clarified effluents which were almost water-clear. Because of the unusually high grease removal obtained by cold acid-cracking of the alkylolamide wastes, the precipitated sludge settled extremely slowly compared with the hot-acid-cracked samples.

TABLE III

Treatment of alkylolamide scouring wastes with bentonite and acid

Scouring agent	pH (untreated waste)	% Grease removal, after indicated treatment: bentonite, 0.1%	sulfuric acid, 65°C	sulfuric acid, 25°C
Surfactant D[a]	8.7	28	77	97
Surfactant E[b]	8.8	47	55	80
Surfactant F[c]	8.4	34	64	99
Surfactant G[d]	8.0	21	61	87
Surfactant H[e]	7.5	0	49	59
Sodium oleate-soda ash	10.0	55	57	86

[a]Diethanolamine-coconut fatty acid condensate.
[b]Fatty alkylolamide.
[c]2:1 type diethanolamine-lauric acid condensate containing 49% dihydroxyethyl lauramide.
[d]1:1 type diethanolamine-lauric acid condensate containing 90% dihydroxyethyl lauramide.
[e]Alkylaryl polyethylene glycol.

An unusual property of the hot-acid-cracked alkylolamide scouring wastes is that upon cooling of clarified effluent to 28° to 30°C further coagulation of the emulsified grease occurs, leaving a supernatant liquor comparable to the clarified liquor obtained by cold acid-cracking. Neither the soap-and-soda-ash waste nor the conventional neutral nonionic waste exhibits this behavior.

Building of the alkylolamides with alkali, neutral salts, alkylaryl-sulfonates, or polyethylene glycol surfactants reduces the effectiveness of grease removal by cold acid-cracking. Similarly, the waste produced by scouring of grease wool directly with alkylolamides without prior desuinting is much less amenable to cold acid-cracking than the waste obtained from scouring desuinted wool.

DESUINTING WASTES———As mentioned in the introduction, desuinting wastes arise from the warm-water steeping of grease wool to remove water-soluble suint and dirt before detergent scouring. In this operation a portion of the wool grease is removed through the emulsifying action of the suint. The procedure of desuinting is almost always employed in scouring plants which operate centrifugal grease-recovery systems.

In contrast to the coagulation behavior of scouring wastes produced by soap or surfactant scouring, waste from the desuinting operation can be clarified with bentonite alone without the necessity of prior acidification.

In our laboratory investigations, desuinting waste samples were prepared by cold-water steeping of the standard grease wool in the ratio of 150 grams of wool per liter of water. The resultant desuinting waste was allowed to sediment for a short period to remove heavier dirt particles and then treated with an aqueous dispersion of bentonite. Approximately 0.15% bentonite on weight of waste was required for effective results. After thorough mixing, the bentonite-treated waste was allowed to sediment for one hour before the clarified liquor was decanted off.

Analysis of the desuinting waste before and after treatment is summarized in Table IV. The principal effect of the bentonite treatment is to reduce the grease content of the waste (by approximately 80%). The water-soluble suint content remains relatively unchanged as indicated by the small decrease in COD and nitrogen content and by the clear, deep-amber color.

Because of its high suint content and low grease and dirt content, the bentonite-clarified liquor has excellent detergent properties and could be recycled, if desired, to the second bowl of a scouring train to reduce the surfactant requirement. Such a procedure would be analogous to the Duhamel suint-scouring process, which depends upon high-speed centrifuging to clarify the suint-scouring liquor.

In order to evaluate the scouring effectiveness of bentonite-clarified desuinting waste, an experiment was carried out in which six 10-gram samples of desuinted wool were scoured successively in 400 ml of clarified suint liquor at 60°C, followed by rinsing in hot water. The residual grease content of these suint-scoured samples varied from 0.6% for the first sample to 2.8% for

TABLE IV

Bentonite treatment of desuinting and suint scouring wastes

Description of sample	pH	Total solids (ppm)	Grease (ppm)	COD (ppm)	Nitrogen (ppm)
Untreated desuinting waste	7.8	24,000	8,300	5,700	590
Bentonite-treated desuinting waste	7.6	17,000	1,700	4,180	430
Reduction, %	—	29	80	27	27
Untreated suint scouring waste	7.9	36,100	14,900	7,940	—
Bentonite-treated suint scouring waste	7.9	21,400	2,500	5,460	—
Reduction, %	—	41	83	31	—

the sixth sample, indicating that the detersive power of the suint liquor falls off rapidly, so that an additional light, detergent scour would be necessary for effective cleaning.

Finally, it is of interest to note that the waste liquor from suint scouring is also amenable to clarification by treatment with bentonite (lines 3 and 4 in Table IV).

ACKNOWLEDGMENTS

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FUTURE PAPERS to Appear in the Proceedings

THE following list is comprised of papers submitted to date for publication in future issues of *Proceedings*. Authors and Technical Program Chairmen are requested to examine this list and call our attention to any omissions.

Papers Presented at the 1958 Convention

"Imparting Wrinkle Resistance to Cotton Fabrics with Triazone Derivatives"—J David Reid, J G Frick Jr, Robert M Reinhardt, and Richard L Arceneaux, Southern Regional Research Laboratory, USDA

"The Dyeing of Wool Pretreated to Produce Contrast Effects"—William Postman, A French Textile School, Georgia Institute of Technology

"Some Observations Regarding the Chlorine Retention of Fabrics Treated with Dimethylol Ethyleneurea"—A R Smith, BIP Chemicals Ltd

"The Use of Dieldrin for Mothproofing Application and Control"—J P Redston, E F Drew & Co, Inc

"Expanding the Market for Nonwoven Fabrics"—L L Shailer Jr, B F Goodrich Chemical Co

"The Finishing and Dyeing of Fiber Glass Drapery Fabrics"—Richard C Horton, J P Stevens & Co, Inc

"The Influences of Finishes on the Properties of Fiber Glass Tapes and Fabrics"—Edwin L Lotz, Hess, Goldsmith & Co, Inc

"Evaluating the Effectiveness of Fluorescent Whiteners and Oxidizing Bleaches on Cotton"—M S Furry, P L Bensing, J L Kirkley, R K Taube, N D Poole, and E S Ross, Clothing and Housing Research Div, USDA

"Evaluation of the Celanese Wrinkle Tester"—Ernest R Kaswell, Fabric Research Laboratories, Inc

"Optical Wrinklemeter"—Richard S Hunter and Clyde A Lofland, Hunter Associates Laboratory, Inc

"Evaluation of the Effectiveness of Antibacterial Finishes for Cloth"—Paul A Majors, Hill Top Research Institute

Papers Presented before Local Sections

"Vat Dyeing of Cotton and Viscose Packages"—Klaus J Bardt, Ciba Co Ltd

"Quantitative Measurement of Fabric Appearance—Practical Evaluation of Wash and Wear Characteristics"—C R Williams, Monsanto Chemical Co

"Reactive Dyestuffs"—E L Caswell, Ciba Co, Inc

"Properties of Kodel Fibers"—E V Martin, Tennessee Eastman Co

"Dyeing and Finishing of Kodel Fiber and Fabrics"—W R Ivey, Jr, Tennessee Eastman Co

"Dyeing and Finishing Blends of Dacron Polyester Fibers and Cellulose Fibers"—C W Holweger Jr, J J Iannarone Jr and R J Thomas, E I duPont de Nemours & Co, Inc

Nonwoven Fabrics: The Technology of Bonding Agents"—John T Taylor, Rohm & Haas Co

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37th National Convention———

RECENT DEVELOPMENTS IN DYEING ORLON*

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Tex'ile Fibers Department
E I duPont de Nemours & Co, Inc

Improved procedures are described for piece dyeing blended fabric of Orlon acrylic fiber and Dacron polyester fiber. A new one-bath method gives better shade duplication and control in a shorter time than was possible with the older two-bath process.

Recent progress in cationic dye synthesis is exemplified by shades dyed on 100% Orlon, which are said to withstand 500 hours exposure in the Weather-Ometer.

INTRODUCTION

DYEING procedures are well known and firmly established for most of the varied end uses where Orlon acrylic fiber enjoys commercial success. In 100 percent form, Orlon is handled routinely as raw-stock, tow, top, yarn in packages or skeins, and knitted or woven fabrics. Blend dyeing, though inherently more complicated than the dyeing of a single fiber, has become well established for blends of Orlon and wool, Orlon/nylon and Orlon/cellulosic fibers. Dyeing procedures for these blends have been tested, mill proven, simplified and improved to the point that further progress in cost reduction is likely to be in small incremental steps rather than in a spectacular jump. But, because of the rapid market expansion of Orlon, dyeing techniques and equipment do vary widely from mill to mill, so that individual dyers may find that they can make a great deal of progress in dyeing these blends for which the technology is good and generally well-established. That is another story, however, one of continuing technical assistance by the fiber manufacturer and the dyes and chemicals manufacturer to ensure that all dyers are familiar with the best techniques for doing the job in their mill.

DISCUSSION

Now, however, there has been an improvement in the art of dyeing a different blend. The practice of blending Orlon and Type 54 Dacron polyester fiber has grown rapidly in the past two or three years. Approximately 1400 summer suits of this blend were sold in 1955, the year of its introduction. This year we estimate that about 500,000 suits and 1,500,000 pairs of slacks of this blend have been sold. This is a clear-cut case of outstanding fabric properties creating a demand for a blend that has been rather difficult to dye. Orlon acrylic fiber contributes bulk, a pleasingly soft surface, and good pilling resistance to the fabric. Dacron polyester fiber contributes outstanding resilience, body and wrinkle recovery. Both fibers contribute to the excellent crease or press retention of this fabric under all conditions of humidity. Many observers believe that the 50/50 blend of Dacron and Orlon is closer to being the ideal summer weight suiting or slack fabric than any yet devised.

Much of the fabric of Dacron/Orlon thus far produced has been piece dyed, either in solid unions or in tone-on-tone effects. Reference here is restricted to Type 54 Dacron, primarily dyed with disperse dyes. The newly developed Type 64 Dacron, dyeable with cationic dyes, is not recommended for blending with Orlon acrylic fiber where piece dyeing is contemplated.

Many tone-on-tone shades have been developed for fabrics composed of 80/20 and 20/80 yarns of Dacron 54/Orlon 42 arranged in plaids, stripes, herringbones or other patterns, to give effects similar to yarn-dyed fancies. The established technique has been to apply disperse dyes to the fabric from a bath containing carrier, usually ortho-phenylphenol, dyeing the Dacron to shade and dyeing the Orlon partially in this first bath. The fabric is then scoured to remove as much carrier as possible. This scour is advisable to eliminate traces of carrier which might otherwise have an adverse effect on dye lightfastness or be precipitated and cause spotting in the second dyeing operation. The Orlon acrylic fiber is then dyed to shade in a fresh bath using cationic dyes and the usual auxiliaries. This method yields entirely satisfactory results, provided the dyeing temperature and carrier concentration in the first bath are adequate for good penetration of the Dacron polyester fiber. Poorly penetrated Dacron fibers—the result of too little carrier or too low a dyeing temperature—will not stand cross dyeing in the second bath without a shade change, which complicates matching and duplication of shades. Under optimum conditions, the total piece goods dyeing cycle—in and out of the dye beck—is anywhere from 15 to 21 hours for the two-bath method.

A new dyeing method has been developed for blends of Dacron/Orlon which makes possible significantly shorter dyeing times, since a one-bath process may be used instead of the usual two-bath procedure. In the new procedure, disperse dyes, Latyl Carrier A, cationic dyes and auxiliaries are added to a single bath and both fibers are dyed simultaneously. In addition to the important time saving, the use of Latyl Carrier A eliminates all possibility of carrier spotting, which is the leading cause of rejects in any type of carrier dyeing. On the negative side, the use of Latyl Carrier A at $1.24/lb more than doubles the carrier cost over that experienced with o-phenylphenol at 42c to 59c per lb.

Detailed examination of this new process develops some interesting facts. One significant observation was made very early in this development —the new method is quite flexible with respect to the order in which dyes and carrier may be added to the dyebaths. Latyl Carrier A is an easily handled powder with a melting point above 212° F. It literally can be shoveled or dumped into the dyebath at any stage or any temperature without the slightest risk of carrier spotting. It does no harm if some of the powder lands on the cloth. However, Latyl Carrier A at the dyeing temperature is a solid with an appreciable vapor pressure, and it sublimes somewhat during the dyeing. Following sublimation or evaporation from the solid state, it condenses to form a crystalline deposit on the relatively cool upper portions

*Presented October 30, 1958 at the Conrad Hilton Hotel, Chicago, Ill, during the 37th National Convention.

TABLE I
One-bath dyeing procedure for blends of Dacron polyester fiber with Orlon acrylic fiber

1) Set dyebath at 120°F.
2) Add disperse dyes (dispersed in hot water and strained).
3) Add 2.0-5.0 g/l Latyl Carrier A (amount depending on depth of shade on the Dacron).
4) Heat to 180°F at rate of 3°F/min.
5) Add cationic dye auxiliaries
   1.0% nonionic surfactant, such as Capracyl Leveling Salt
   0.5% sodium acetate
   acetic acid to pH 5
   retarder as needed.
6) Add cationic dyes.
7) Heat to boil at rate of 1°F/min.
8) Boil two hours and sample.

TABLE II
Shades on a 50/50 blended fabric of Dacron polyester fiber and Orlon acrylic fiber
One-bath Method

1) *Charcoal Blue Plaid (Dacron blue, Orlon black)*
   0.10% Latyl Yellow 3G
   0.42% Latyl Cerise B
   1.40% Latyl Brilliant Blue BG
   0.60% Latyl Violet 2R
   3.5 g/l Latyl Carrier A
   0.56% CI Basic Yellow 11
   1.20% CI Basic Red 14
   0.34% CI Basic Green 4

2) *Medium Gray Union*
   0.14% CI Disperse Yellow 2
   0.38% Latyl Cerise B
   0.74% Latyl Brilliant Blue BG
   0.08% Sevron Yellow 3RL
   0.16% Sevron Red GL
   1.00% CI Basic Blue 22
   3.0% Du Pont Retarder LAN
   3.5 g/l Latyl Carrier A

3) *Brown Plaid (Dacron tan, Orlon dark brown)*
   0.08% Latyl Blue BG (Brilliant)
   0.08% Latyl Yellow 3G
   0.014% Latyl Cerise B
   0.06% Latyl Violet 2R
   1.80% Sevron Yellow 3RL
   1.40% CI Basic Red 14
   1.44% CI Basic Blue 21
   0.226% CI Basic Green 4
   No Carrier

4) *Charcoal Gray Union*
   0.75% Latyl Yellow 4RL
   0.82% Latyl Cerise B
   0.64% Latyl Brilliant Blue BG
   2.30% Latyl Violet BN
   0.48% Sevron Yellow 3RL
   0.56% Sevron Red GL
   2.20% CI Basic Blue 22
   1.40% CI Basic Blue 21
   0.5% Du Pont Retarder LAN
   5.0 g/l Latyl Carrier A

5) *Blue Plaid (Orlon navy, Dacron light blue)*
   0.002% Latyl Yellow 3G
   0.008% Latyl Cerise B
   0.280% Latyl Brilliant Blue BG
   0.016% Latyl Violet 2R
   0.56% Sevron Yellow 3RL
   1.20% CI Basic Red 14
   0.34% CI Basic Green 4
   No Carrier

6) *Navy Union*
   0.48% Latyl Yellow 4RL
   0.50% Latyl Cerise B
   1.00% Latyl Brilliant Blue BG
   3.20% Latyl Violet BN
   0.14% CI Basic Yellow 11
   0.80% CI Basic Red 14
   0.48% Sevron Blue 5G
   0.24% CI Basic Green 4
   5.00 g/l Latyl Carrier A

7) *Dark Gray Plaid (Orlon black, Dacron gray)*
   0.14% Latyl Yellow 4RL
   0.36% Latyl Cerise B
   1.00% Latyl Brilliant Blue BG
   0.12% Latyl Violet 2R
   0.60% CI Basic Yellow 11
   0.80% Sevron Orange L
   1.20% CI Basic Red 14
   0.38% CI Basic Green 4
   3.5 g/l Latyl Carrier A

8) *Gray Plaid (Orlon black, Dacron light gray)*
   0.200% Latyl Brilliant Blue BG
   0.002% Latyl Yellow 3G
   0.004% Latyl Cerise B
   0.008% Latyl Violet 2R
   0.750% CI Basic Yellow 11
   1.200% CI Basic Red 14
   0.340% CI Basic Green 4
   No carrier

9) *Dark Brown Union*
   1.80% Latyl Yellow 4RL
   1.10% Latyl Cerise B
   0.72% Latyl Brilliant Blue BG
   1.40% Latyl Violet BN
   2.20% Sevron Yellow 3RL
   0.76% CI Basic Red 14
   1.20% CI Basic Blue 21
   0.20% CI Basic Green 4
   0.5% Du Pont Retarder LAN
   5.0 g/l Latyl Carrier A

All shades dyed with (percentages based on fabric weight)
1.0% nonionic surfactant (eg. Capracyl Leveling Salt)
0.5% sodium acetate
3.0% acetic acid (56%)
Carrier and retarder as shown.

of the dye beck as the dyeing progresses. This fluffy white deposit or "frost" is completely harmless, but is apt to scare the uninitiated when they first notice it. If the deposit gets rather heavy after one or more dyeings, it can be dislodged with a stick or a scoop handle and allowed to fall back into the bath. Again, it is completely harmless even if it falls on the cloth. An overhead steam line washes down most of the deposit.

A sequence of operations has been developed for the one-bath dyeing process as shown in Table I.

Addition of the auxiliaries and cationic dyes at 180° F provides a convenient reminder for the dyebeck operator to heat to the boil (208-12°F) from this point at 1°F per min. The slow temperature rise assures levelness. Fully enclosed dyebecks are essential in dyeing Orlon acrylic fiber or Dacron polyester fiber, and an auxiliary steam line in the upper part of the beck is a big help in maintaining the 208°F minimum temperature for efficient dyeing. We recommend using one percent Capracyl Leveling Salt (based on weight of fabric) in the bath to prevent coagulation or precipitation of cationic dyes or cationic retarder. Note, also, that Glauber's salt is not used. We have dispensed with adding anionic dispersing agents to the bath —these are apt to cause dye precipitation in this system. The Latyl disperse dyes for example, have performed excellently under the recommended conditions and are easily dispersed in hot water.

A number of shades have been dyed in mill-scale equipment at our Textile Research Laboratory using the foregoing procedure. For this work we have used a commercial eight-oz fabric which has a finished width of 58 inches. In one style the yarns are composed of 20/80 and 80/20 blends of Dacron 54 with Orlon 42, arranged in a plaid pattern. The average blend composition is 50/50. We have used another style composed of the same 80/20 and 20/80 yarns in an end and end and pick and pick arrangement for solid union shades. This is a most critical arrangement for dyeing solid shades. (See Table II).

All of these shades have 40 to 80 hours Fade-Ometer fastness or better. Latyl Carrier A has no adverse effects on dye lightfastness. Wash, perspiration, sublimation and dry-cleaning fastness ratings are also excellent for these dyeings. Ratings for the shades are shown in Table III.

Duplication of shades has been amazingly good. These formulas were developed on five-gram laboratory swatches and reproduced in 20-yard sample beck dyeings, and then in commercial-scale dyeings. We believe that, with the new process, mills should be able to reduce significantly the number of dye adds required in dyeing this blend. However, to confirm the feasibility of making shade corrections, we applied several of the above formulas at 50 percent strength, then made two 25 percent adds of both classes of dyes, bringing the pieces to shade with no difficulty. To make adds, the bath is cooled to 180°F, disperse and/or cationic dyes are added (separately if both classes are needed), the temperature is raised to the boil, and boiling is continued for 45 minutes to one hour.

As indicated, the new procedure offers savings in time, rehandles and rejects versus an increased chemical cost.

Table IV represents an attempt to estimate the time required in each step of the new process, and Table V does the same thing for the older two-bath method. The time required for each operation, such as loading a dyebeck, varies considerably from mill to mill and we do not pretend that these figures are necessarily representative of the industry. We believe the comparison is valid, since most of the operations are common to both dyeing methods.

Notice that we assume three hours to make shade corrections in the one-bath method as compared to six hours

TABLE III
Fastness properties—50/50 Dacron polyester fiber, Orlon acrylic fiber (One-bath method)

Shade	AATCC Fade-Ometer rating	Washing at 140°F with soap		AATCC Acid Perspiration alkaline				AATCC drycleaning		Sublimation @ 300°F 30 sec		Hot-moist pressing		AATCC crocking	
		SC	S	SC	S	SC	S	SC	S	SC	S	SC	S	dry	wet
Charcoal Blue Plaid	6	5	5	5	5	5	5	4D	5	5	5	5	5	5	5
Gray Plaid	6	5	5–4	5	5	5	5	5–4D	5	5	5	5	5	5	5
Brown Plaid	6	5	4	5	5	5	5	5–4D	5–4	5	5	5	5	5	5
Dark Gray Plaid	6	5	4	5	5	5	5	5–4D	5	5	5	5	5	5–4	5–4
Medium Gray Union	7	5	5	5	5	5	5	5–4D	5	5	5	5	5	5	5
Blue Plaid	6	5	5–4	5	5	5	5	5	5	5	5	5	5	5	5
Dark Brown Union	6	5	3 (nylon)	5	4	5	3	4Y	5–4	5	5	5	5–4	4	4
Charcoal Gray Union	7	5	4	5	5–4	5	4	5–4D	5–4	5	5	5	5	5–4	5–4
Navy Union	6	5	4	5	5–4	5	5–4	4YD	5–4	5	5	5	5	5	5

to make dye additions in the two-bath method. This is a key point; with the one-bath system, the dyer can correct with either cationic dyes or disperse dyes or both, merely by cooling the bath to 180°F, adding the dye, heating the bath slowly to the boil and boiling for an hour. On the other hand, in the two-bath procedure, the dyer can correct the Dacron only by cooling and dropping the bath and then establishing a fresh bath with carrier. The six hours estimated for making shade corrections may be low and the actual time advantage of the one-bath method may be greater than we have assumed. Furthermore, there is a negligible chemical cost for adds made in the one-bath method, whereas adds made to the Dacron in the two-bath method nearly double the total chemical cost.

In the work done in our laboratories, we have satisfied ourselves that the time savings possible with the one-bath system will compensate for the higher cost of Latyl Carrier A as compared with other less expensive carriers. We also feel there is a very definite plus in favor of the one-bath process: the elimination of rehandles caused by carrier spots.

No doubt and arithmetical comparison could be developed showing the relative costs of the two methods; however, since cost accounting methods differ so widely from plant to plant, we feel such a comparison would actually mean nothing unless figures for a specific plant were available.

In short, a mill should be able to increase production at no over-all increase in cost per yard—provided equipment is suitable for the operation of this method. In addition, there is the bonus of elimination of carrier spots and resultant rehandling.

The possibility of employing cheaper carriers in the one-bath process has been investigated. To date our results have been unsuccessful. Two problems have been encountered in attempting to use orthophenylphenol in a bath containing disperse dyes, cationic dyes and auxiliaries. First, the cationic dyes and cationic retarders tend to break the dispersion of the phenol, causing tarring and extensive spotting. Second, if one attempts to maintain carrier dispersion by using an excess of anionic dispersing agents, the cationic dyes are held in the bath by the anionic agent and exhaust poorly in heavy shades, making shade matching virtually impossible. However, there is still a possibility that a practical procedure may be developed.

TABLE IV
One-bath method for blends of Dacron polyester fiber with Orlon acrylic fiber Time Requirements

Step	Time (min)
1) Load 20 ft. dyebeck	35
2) Scour at 180° F	60
3) Set fresh bath at 120° F	30
4) Add disperse dyes	15
5) Add 3.5 g/l Latyl Carrier A	15
6) Heat to 180° F	20
7) Add auxiliaries	15
8) Add cationic dyes	15
9) Raise to boil 1°/min	30
10) Boil two hours	120
11) Sample and approve shade	30
12) Cool slowly	45
13) Hot rinse	45
14) Cooling rinse	20
15) Unload beck	35
Total no-add dyeing	8 hours 50 minutes
Total with adds	12 hours

TABLE V
Two-bath method for blends of Dacron polyester fiber with Orlon acrylic fiber Time Requirements

Step	Time (min)
1) Load 20 ft dyebeck	35
2) Scour @ 180°F	60
3) Set fresh bath @ 120°F	30
4) Add 3.5 g/l o-phenylphenol and auxiliaries	45
5) Add disperse dyes	15
6) Raise to boil @ 3°F/min	30
7) Boil two hours	120
8) Sample and approve shade	30
9) Cool slowly	45
10) Scour @ 200°F	60
11) Cool slowly	45
12) Set fresh bath @ 120°F	30
13) Add auxiliaries	15
14) Add cationic dyes	15
15) Raise to 180°F @ 3°/min	20
16) Raise to boil @ 1°/min	30
17) Boil 1.5 hrs	90
18) Sample and approve shade (while cooling)	30
19) Cool slowly	45
20) Hot rinse	45
21) Cooling rinse	20
22) Unload beck	35
Total (no-add dyeing)	14 hours 50 minutes
Total (with adds)	21 hours

TABLE VI
Finishing sequence—8-oz suiting of 50/50 Dacron polyester fiber, Orlon acrylic fiber

1) Desize (for starch sizing)
2) Scour
3) Dye
4) Extract and frame dry
5) Pad on antistatic finish
6) Dry
7) Heat set @ 350°F
8) Brush and shear closely
9) Press
10) Semidecate

FINISHING——The finishing of blended fabrics of Dacron polyester fiber and Orlon acrylic fiber is simple and straight-forward, regardless of the dyeing method employed. The most significant step is heat setting. The setting temperature should be about 250°F, with the time depending on the method used. In hot roll machines about 20 seconds is adequate, whereas in a hot air oven a longer time, about one minute, is required. Temperatures much above 350°F yellow the Orlon, while temperatures below 350°F are ineffective in stabilizing the Dacron fibers to subsequent pressing. Certain critical shades, such as light gray or light blue are affected (deepened) by the recommended heat treatment, whether dyed by the one-bath or the two-bath method. The dyer should allow for this change by heat treating his sample patches before comparision with the standard.

Excellent resistance to pilling has been achieved with 50/50 blends of Dacron and Orlon by heat setting and brushing and shearing. Singeing has not been necessary with the fabrics we have tested, even those made with singles yarn. However, singeing could be used if desired. A typical finishing sequence is shown in Table VI.

A durable antistatic finish is suggested for fabrics that will be used in cold weather.

SHADES FOR OUTDOOR FABRICS OF ORLON———A second recent development in Orlon acrylic fiber dyeing technology of interest to practical dyers is applicable to 100% Orlon, rather than a blend. Some of the newest cationic dyes on Orlon have outstanding fastness to weathering. The shades shown in Table VII show no more than an appreciable break after 500 hours exposure in the Weather-Ometer.

It should be pointed out that the Weather-Ometer is kinder to these shades than is the Fade-Ometer. Most of them fade considerably after 200-300 hours in the Fade-Ometer, but run 500 hours before a comparable break is reached in the Weather-Ometer. Outdoor exposures are under way to confirm these promising results.

The excellent fastness of these shades coupled with the outstanding durability of the fiber to weathering has opened the way for Orlon acrylic fiber to be used in a variety of outdoor applications. Alert dyers will capture new business by being able to deliver this degree of fastness.

TABLE VII
Shades on Orlon acrylic fiber for 500 hours fastness to weathering

Yellow
1.5% Astrazon Yellow 7GLL

Copper
3.0% Sevron Brown YL
0.3% Sevron Blue BGL

Dark Brown
3.0% Sevron Brown YL
2.25% Sevron Blue BGL

Melon
1.0% Sevron Red GL
0.3% Maxilon Red BL

Red
2.0% Sevron Red GL
2.0% Maxilon Red BL

Light Blue
0.5% Sevron Blue BGL
0.5% CI Basic Blue 21

Deep Blue
3.8% Sevron Blue BGL
1.7% CI Basic Blue 21

Green
1.1% Astrazon Yellow 7GLL
2.0% Sevron Blue BGL
2.0% CI Basic Blue 21

All shades were dyed with:
0.5% Alkanol HCS surface-active agent
10.0% sodium sulfate
acetic acid to pH 5
2-4% Du Pont Retarder LAN as necessary

ACKNOWLEDGMENTS

The authors wish to acknowledge the contributions of Robert A Pearson, Charles Keresztes, and Otto A Ofjord, who developed much of the information presented in this paper.

REFERENCE

(1) Anon, Du Pont Textile Fibers Dept, Technical Information Bulletin OR-82, Dec 1957, p 18.

TRADEMARKS

The following are registered trademarks of E I duPont de Nemours & Co, Inc: Orlon, Dacron, Latyl, Capracyl, Sevron, and Alkanol.

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Important Notice To All Manufacturers of Dyes and Pigments

NOW that the Second Edition of the *Colour Index* has been published, the *American Association of Textile Chemists and Colorists* and the *Society of Dyers and Colourists* propose to issue every three months lists of Addition and Amendments and, at intervals of several years, supplementary volumes. The lists will enable users of the *Colour Index* to keep it up to date by providing them promptly with *Colour Index* Part I (application) generic names (designations) for new products, with Part II (constitution) numbers when information permits, and with new trade names, changes in names, names to be deleted, and other changes, as they are reported to the Association or Society. Thus the quarterly lists will be helpful to all who use *Colour Index* names and numbers in commerce, in reporting production and sales of dyes and pigments to the Federal Government, in matters relating to importation of dyes, licensing, patents, etc.

The lists will be published in the *American Dyestuff Reporter*, probably in January, April, July, and October, and reprints, printed on one side of the page only, will be available. The lists will not contain detailed technical information about the dyes. This information will be given in the supplementary volumes.

We feel sure that we can rely on your cooperation in this task of keeping the *Colour Index* current, and invite you now to bring your lists of dyes up to date as of December 31, 1958. Following that we ask you to send further information at intervals of three months.

The information desired now is outlined below. At a later date more detailed information for the supplementary volume will be requested. If you prefer to supply full information now we shall be pleased to receive it, but it is important for us to receive the basic information requested as soon as possible.

INFORMATION REQUIRED FOR LISTS OF ADDITIONS AND AMENDMENTS TO THE COLOUR INDEX

The information required includes: 1) alterations in names or brand marks of present entries in the *Colour Index* and other changes that you consider necessary, including if desired constitutions not heretofore revealed; 2) names of products no longer manufactured and so requiring deletion; and 3) additions to the range of dyes and pigments you manufacture. Examples of each type of information are given below.

Please list only:

1) Products manufactured by you or by a manufacturer for whose products you are the sole selling agent.
2) Products not properly covered in the Second Edition or in the list of amendments and additions supplied with Volume 4 of the Second Edition.
3) Homogeneous ("straight") products except where one of the major components of a mixture is not sold separately, or where the mixture is necessary to complete a range of shades, eg, vat printing blacks, acetate navy blues, etc.

Be sure each list you submit gives:

1) The name and address of your company.
2) The name of the individual who is to be contacted if further information is required.

Submit one list of the items that do not require a new *Colour Index* Part I generic name. Use letter size paper, one side of the page only. Submit at least eight copies of the list. If the list runs to a full page or more and you can supply 20 copies, please do so as this will speed the review and publication of the information.

Submit a separate list of the products that you think require new *Colour Index* Part I generic names. Give the information called for below each item. Submit at least eight copies of the list (20 copies if you can conveniently).

1) Trade name of the product.
2) Your CI code letters (or company name).
3) Hue (shade) produced in principal use—in accordance with Volume 1, page XVII, and the Hue Indication chart in the pocket of Volume 4.
4) Usage Class—See appropriate sections in Volumes 1 and 2. Acid, Mordant, Basic, Disperse, Natural (Dyes and Pigments), Food, Leather, Direct, Sulphur, Vat, Ingrain, Azoic Diazo Component, Azoic Coupling Component, Azoic Composition, Reactive, Oxidation Base, Pigment, Solvent Dye, Fluorescent Brightening Agent, Developer, Reducing Agent.

5a) Has the product been or is it being produced by another firm or firms?
5b) If so, under what name or names?
5c) Is it being sold under another name(s) by you?
5d) If so, what name(s)?

6) Constitution, if available for publication.
7) Other information (optional)

Manufacturers located in North, Central, and South America except Canada should send information to the undersigned. All others should report to the Society of Dyers and Colourists, Dean House, 19 Piccadilly, Bradford 1, Yorkshire, England.

WILLIAM D APPEL,
AATCC Coordinator for *Colour Index* Supplements,
9101 Jones Mill Road, Chevy Chase 15, Maryland.

Examples

Page (a)	(b)		(c)	(d)
1141	Acid Red 114	*add*	Milling Red SWB	DuP
1297	Acid Blue 154	*delete*	Fenapal Blue 2R	G
2381	Solubilized Sulphur Blue 10	*under*	"Applied by method 6"	
		add	Sulphosol Sky Blue S3B	JR
3572	74260	*change*	(3) Convert tetrachlorophthalic anhydride to hexachloro copper phthalocyanine—	
		to	(3) Convert tetrachlorophthalic anhydride to hexadecachloro copper phthalocyanine—	

Notes: (a) Page in the Second Edition on which item will appear.
(b) CI Part I generic name, when reference is to a Part I listing, or Part II number when reference is to a Part II listing.
(c) Action to be taken.
(d) Manufacturer's code letters — See Volume 4, Page 4001.

COLOUR INDEX

Additions and Amendments

Number 2* January 1959

IN conformity with the policy stated in the preamble to the *Colour Index*, it is intended to publish in January, April, July and October issues of *American Dyestuff Reporter* and the *Journal of the Society of Dyers and Colourists* a list of additions and amendments to the Second Edition of the *Colour Index* which have been reported to the American Association of Textile Chemists and Colorists or the Society of Dyers and Colourists during the previous three months.

Copies of these lists printed on one side of the paper only probably will be made available. For further details apply to AATCC National Headquarters, P O Box 28, Lowell, Mass.

*The first list was published in the November 3, 1958 issue of *American Dyestuff Reporter*, page P776.

VOLUME 1

Additional *Colour Index* Number and Designation

1305	CI 18058	Monoazo	CI Acid Blue 174
		Hue	
		Acid Blue B	Pol

Amendments

Page	*Colour Index Designation*	
1008	CI Acid Yellow 11	
	add Egacid Yellow G	Chem
1011	CI Acid Yellow 18	
	add Fast Acid Yellow 2G	Pol
1013	CI Acid Yellow 23	
	add Tartrazine O	Chem
1014	CI Acid Yellow 25	
	add Midlon Yellow R	Chem
1019	CI Acid Yellow 36	
	add Metanile Yellow O	Chem
1022	CI Acid Yellow 42	
	add Midlon Yellow PR	Chem
1056	CI Acid Orange 7	
	add Orange II	Chem
1057	CI Acid Orange 8	
	add Orange RO	Chem
1058	CI Acid Orange 10	
	add Egacid Orange GG	Chem
1062	CI Acid Orange 19	
	add Midlon Red GG	Chem
1073	CI Acid Orange 45	
	add Midlon Orange PR	Chem
1091	CI Acid Red 1	
	add Egacid Red G	Chem
1097	CI Acid Red 14	
	add Chromotrop FB	Chem
1103	CI Acid Red 27	
	add Victoria Rubine O	Chem
1107	CI Acid Red 35	
	add Midlon Red 3B	Chem
1117	CI Acid Red 57	
	for Kiton Fast Rubine 3G	Ciba
	read Kiton Fast Red 3GP	Ciba
1123	CI Acid Red 73	
	add Brilliant Croceine MOOL	Chem
1126	CI Acid Red 81	
	add Alizarine Rubine GW	Acna
1128	CI Acid Red 85	
	add Midlon Red PG	Chem
1130	CI Acid Red 88	
	add Fast Red A	Chem
1134	CI Acid Red 97	
	add Alizarine Chrome Red G	Chem
1191	CI Acid Violet 1	
	add Acid Fast Violet L	Chem
1194	CI Acid Violet 7	
	add Egacid Red 6B	Chem
1211	CI Acid Violet 43	
	add Alizarine Violanol R	Chem
1229	CI Acid Blue 1	
	add Carmine Blue VF	Acna
1232	CI Acid Blue 7	
	add Carmine Blue AF	Acna
1241	CI Acid Blue 27	
	add Alizarine Turquoise Blue B	Chem
1246	CI Acid Blue 40	
	add Alizarine Azurol A2G	Chem
1248	CI Acid Blue 43	
	add Alizarine Deep Blue R	Chem
1250	CI Acid Blue 47	
	add Alizarine Deep Blue R	Chem
1264	CI Acid Blue 78	
	add Alizarine Pure Blue B	Chem
1271	CI Acid Blue 92	
	add Wool Fast Blue R	Chem
1280	CI Acid Blue 113	
	add Wool Fast Blue 5R	Chem
1283	CI Acid Blue 120	
	add Wool Fast Blue GR	Chem
1293	CI Acid Blue 145	
	add Alizarine Azurol ASR	Chem
1316	CI Acid Green 20	
	add Acid Black HG	Chem
	add Naphthol Green Black B	S
1318	CI Acid Green 25	
	add Alizarine Brilliant Green G	Chem
1324	CI Acid Green 41	
	add Alizarine Brilliant Green 5G	Chem

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Page	Colour Index Designation	
1329	CI Acid Brown 2	
	add Midlon Brown R	Chem
1353	CI Acid Brown 75	
	add Koranil Brown ER	Chem
1354	CI Acid Brown 83	
	add Koranil Brown CGG	Chem
1355	CI Acid Brown 88	
	add Koranil Brown ITF	Chem
1375	CI Acid Black 1	
	add Acid Black 10B	Chem
1376	CI Acid Black 2	
	add Nigrosine WL Water Soluble	Chem
1384	CI Acid Black 24	
	add Midlon Black P2B	Chem
1385	CI Acid Black 26	
	add Wool Fast Black VL	Chem
	CI Acid Black 26A	
	add Wool Fast Black 4B	Chem
1393	CI Acid Black 48	
	add Alizarine Fast Acid Grey BBLW	Chem
1395	CI Acid Black 52	
	add Printing Black for Silk BW	Chem
1403	CI Acid Black 84	
	add Stenile Grey GC	Acna
1408	CI Mordant Yellow 3	
	add Alizarine Chrome Yellow BN	Chem
1410	CI Mordant Yellow 8	
	add Alizarine Chrome Fast Yellow R	Chem
1419	CI Mordant Yellow 26	
	add Chromocitronine R	Pol
1433	CI Mordant Orange 1	
	add Alizarine Chrome Orange G	Chem
1436	CI Mordant Orange 6	
	add Alizarine Chrome Orange GR	Chem
1453	CI Mordant Red 5	
	add Alizarine Chrome Garnet R	Chem
1455	CI Mordant Red 9	
	add Alizarine Chrome Red BG	Chem
1507	CI Mordant Blue 9	
	add Alizarine Chrome Blue RR	Chem
1509	CI Mordant Blue 13	
	add Acid Chrome Navy Blue B	Pol
	add Alizarine Chrome Blue B	Chem
1532	CI Mordant Green 4	
	add Viridon B	Pol
1551	CI Mordant Brown 1	
	add Acid Chrome Brown EB	Pol
1557	CI Mordant Brown 15	
	add Alizarine Chrome Brown KE	Chem
1565	CI Mordant Brown 33	
	add Acid Chrome Brown 2R	Pol
	add Alizarine Chrome Brown RH	Chem
1566	CI Mordant Brown 35	
	add Alizarine Chrome Brown V	Chem

Page	Colour Index Designation	
1568	CI Mordant Brown 40	
	add Alizarine Chrome Brown PG	Chem
1587	CI Mordant Black 5	
	add Acid Chrome Black FW	Pol
1588	CI Mordant Black 7	
	add Alizarine Chrome Black P2B	Chem
	CI Mordant Black 8	
	add Diacromo Black PLC conc.	Acna
1589	CI Mordant Black 9	
	add Alizarine Chrome Black PV	Chem
1590	CI Mordant Black 11	
	add Acid Chrome Black ET	Pol
	add Alizarine Chrome Black PT, PT Supra	Chem
1591	CI Mordant Black 13	
	add Alizarine Blue Black B	Chem
1592	CI Mordant Black 15	
	add Acid Chrome Black 4RF	Pol
	add Alizarine Chrome Black 4R	Chem
1593	CI Mordant Black 17	
	add Alizarine Chrome Black 6B	Chem
1609	CI Mordant Black 56	
	add Acid Chrome Grey GR	Pol
1623	CI Basic Orange 1	
	add Chrysoidine R	Chem
1634	CI Basic Violet 3	
	add Crystal Violet O	Chem
1649	CI Basic Brown 1	
	add Bismarck Brown GC	Chem
1650	CI Basic Brown 4	
	add Vesuvine JBLX	Chem
1735	CI Dispense Black 2	
	add Naphtoelan Black D Base	Pol
1775	CI Food Yellow 3	
	add Acid Yellow TRA	Acna
	add Yellow SY for Food	Chem
1783	CI Food Red 2	
	add Acid Scarlet GNA	Acna
	CI Food Red 3	
	add Azo Rubine for Food	Chem
1784	CI Food Red 4	
	add Fast Red E	Acna
	add Red E for Food	Chem
1785	CI Food Red 7	
	add Kochineal Red A for Food	Chem
	CI Food Red 8	
	add Ponceau 6RA	Acna
	CI Food Red 9	
	add Victoria Rubine O for Food	Chem
1791	CI Food Blue 1	
	add Indigo Carmine AC	Acna
1797	CI Food Black 1	
	add Brilliant Black BN	Acna
	add Brilliant Black BN for Food	Chem

VOLUME 2
Additional *Colour Index* Designations

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2655		CI Azoic Red 65
	Hue — Bright Red	
	Ronagen Red I4G	RL
		CI Azoic Red 66
	Hue — Bright Reddish Violet	
	Ronagen Brilliant Ruby B	RL

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2666		CI Azoic Blue 25
	Hue — Blue	
	Ronagen Brilliant Blue R	RL
		CI Azoic Blue 26
	Hue — Blue	
	Ronagen Brilliant Blue 3G	RL
2678		CI Azoic Black 7
	Hue — Black	
	Ronagen Black IL	RL
	Sinagen Black IL	RL

Amendments

Page	Colour Index Designation	
2008	CI Direct Yellow 11	
	add Direct Yellow G	Chem
2009	CI Direct Yellow 12	
	add Chrysophenine G	Chem
2015	CI Direct Yellow 28	
	add Saturn Yellow LFF	Chem
2016	CI Direct Yellow 29	
	add Saturn Yellow LRT	Chem
2022	CI Direct Yellow 44	
	add Saturn Yellow L4G	Chem
2024	CI Direct Yellow 49	
	add Saturn Yellow LG	Chem
	CI Direct Yellow 50	
	add Saturn Yellow LR	Chem
2033	CI Direct Yellow 70	
	add Cuprostan Yellow GRLL	Chem
2047	CI Direct Orange 26	
	add Direct Fast Orange S	Chem
2050	CI Direct Orange 34	
	add Saturn Orange L7G	Chem
2051	CI Direct Orange 37	
	add Saturn Orange LER	Chem
2075	CI Direct Red 1	
	add Direct Red F	Chem
2076	CI Direct Red 2	
	add Cotton Red 4B	Chem
2080	CI Direct Red 13	
	add Direct Bordeaux B	Chem
2083	CI Direct Red 23	
	add Direct Fast Scarlet 4B	Chem
2086	CI Direct Red 28	
	add Cotton Red 4BC	Chem
2101	CI Direct Red 75	
	add Saturn Pink 2B	Chem
	CI Direct Red 76	
	add Saturn Scarlet LGG	Chem
2103	CI Direct Red 79	
	add Saturn Red L4B	Chem
	CI Direct Red 80	
	add Saturn Red F3B	Chem
2104	CI Direct Red 81	
	add Saturn Red B	Chem
2105	CI Direct Red 83	
	add Helion Violet 2RL	Pol
2143	CI Direct Violet 1	
	add Direct Violet FR	Chem
2144	CI Direct Violet 5	
	add Direct Violet RL	Chem
2162	CI Direct Violet 66	
	add Saturn Violet L4B	Chem
2170	CI Direct Blue 2	
	add Direct Black BH	Chem
2172	CI Direct Blue 6	
	add Direct Blue 2B	Chem
2173	CI Direct Blue 8	
	add Direct Blue G	Chem
2193	CI Direct Blue 67	
	add Saturn Blue L3R	Chem
2195	CI Direct Blue 71	
	add Saturn Blue LBRR	Chem
2198	CI Direct Blue 78	
	add Saturn Blue L4G	Chem
2201	CI Direct Blue 86	
	add Saturn Turquoise Blue LG	Chem
2205	CI Direct Blue 98	
	add Saturn Blue LFBG	Chem
2208	CI Direct Blue 106	
	add Saturn Blue LFF2G	Chem
2213	CI Direct Blue 120	
	add Azogen Blue BR	Chem
2227	CI Direct Blue 159	
	add Cuprostan Blue GLL	Chem
2229	CI Direct Blue 162	
	add Cuprostan Blue RLL	Chem
2231	CI Direct Blue 168	
	add Direct Blue CBB	Chem
2237	CI Direct Green 1	
	add Direct Black Green N	Chem
2239	CI Direct Green 6	
	add Direct Green B	Chem
2240	CI Direct Green 8	
	add Direct Green TG	Chem
2250	CI Direct Green 34	
	add Saturn Green LBT	Chem
2264	CI Direct Brown 2	
	add Direct Brown M	Chem
2272	CI Direct Brown 25	
	add Direct Catechine G	Chem
2273	CI Direct Brown 27	
	add Direct Brown B3G	Chem
2276	CI Direct Brown 33	
	add Direct Catechine B	Chem
2286	CI Direct Brown 59	
	add Direct Brown B	Chem
2292	CI Direct Brown 78	
	add Koranil Brown L3R	Chem
	add Saturn Brown L3R	Chem
2295	CI Direct Brown 95	
	add Saturn Brown LBR	Chem
2297	CI Direct Brown 101	
	add Saturn Brown 2RT	Chem
2301	CI Direct Brown 112	
	add Saturn Brown L8R	Chem
2316	CI Direct Brown 162	
	add Cuprostan Brown RL	Chem

Page	Colour Index Designation	
2321	CI Direct Brown 175	
	add Cuprostan Brown 5RLL	Chem
2326	CI Direct Black 4	
	add Direct Black RW	Chem
2328	CI Direct Black 9	
	add Direct Black FF	Chem
2331	CI Direct Black 17	
	add Azogen Black D	Chem
2332	CI Direct Black 19	
	add Direct Fast Black G	Chem
2339	CI Direct Black 38	
	add Direct Black GW	Chem
	add Formaline Black C	Chem
	CI Direct Black 41	
	add Velur Leather Black S	Chem
2342	CI Direct Black 51	
	add Saturn Black B, VE	Chem
2344	CI Direct Black 56	
	add Saturn Grey LRN	Chem
2381	CI Solubilized Sulphur Blue 10 under "Applied by method 6"	
	add Sulphosol Sky Blue S3B	JR
2413	CI Solubilized Sulphur Black 1 under "Applied by method 4"	
	add Lyosulfogen Black B under "Applied by method 6"	Chem
	add Sulfatin Black BWLE	Chem
	add Sulfosol Black TG	Chem
2417	CI Sulphur Black 11 under "Applied by method 1"	
	add Sulfocarbon CL	Chem
2428	CI Vat Yellow 2	
	add Ostanthren Yellow GC	Chem
2430	CI Vat Yellow 4	
	add Helanthrene Yellow GOK	Pol
2432	CI Vat Yellow 9	
	add Ostanthren Yellow GF	Chem
2439	CI Vat Yellow 26	
	add Helanthrene Yellow 5GK	Pol
	add Ostanthren Yellow 5GK	Chem
2443	CI Vat Orange 1	
	add Helanthrene Yellow RK	Pol
2445	CI Vat Orange 3	
	add Helanthrene Orange RK	Pol
2447	CI Vat Orange 5	
	add Vat Orange RF	Pol
2450	CI Vat Orange 11	
	add Helanthrene Yellow 3RT	Pol
	add Ostanthren Yellow 3RT	Chem
2454	CI Vat Orange 19	
	add Helanthrene Orange GK	Pol
2455	CI Vat Red 1	
	add Helanthrene Pink R	Pol
2475	CI Vat Red 45	
	add Helanthrene Scarlet GG	Pol
2479	CI Vat Violet 1	
	add Romantrene Brilliant Violet F2R, F4R	Acna
2485	CI Vat Violet 9	
	add Romantrene Brilliant Violet F3B	Acna
2494	CI Vat Blue 4	
	add Helanthrene Blue RS	Pol
	add Ostanthren Blue RSN, RS under "Special physical forms for paper, etc"	Chem
	add Ostanthren Blue RSZ	Chem
	add (*Specially prepared physical form for printing inks*) Versal Blue GGSL	Chem

Page	Colour Index Designation	
2495	CI Vat Blue 5	
	add Vat Blue 4B	Pol
2496	CI Vat Blue 6	
	add Helanthrene Blue BC, GCD	Pol
	add Ostanthren Blue BCL, BCS under "The following brands are similar"	Chem
	add Romantrene Blue FRC	Acna
2500	CI Vat Blue 12	
	add Ostanthren Blue Ti under "Purified brands"	Chem
	add Romantrene Brilliant Blue F3G	Acna
2501	CI Vat Blue 14	
	add Ostanthren Blue GCD, GCG	Chem
2502	CI Vat Blue 16	
	add Romantrene Navy Blue FG	Acna
2504	CI Vat Blue 20	
	add Helanthrene Dark Blue BO	Pol
2506	CI Vat Blue 25	
	add Ostanthren Navy Blue R	Chem
2513	CI Vat Blue 42	
	for Vat Blue G	Acna
	read Tinaldene Blue G	Acna
2514	CI Vat Blue 43	
	add Hydron Blue 3R	CFM
	add Tinaldene Blue CR, 2R	Acna
2519	CI Vat Green 1	
	add Brilliant Green FFB	Chem
	add Helanthrene Green B	Pol
2520	CI Vat Green 2	
	add Romantrene Brilliant Green F2G	Acna
	add Helanthrene Green 2G	Pol
2521	CI Vat Green 3	
	add Helanthrene Olive Green B	Pol
	add Ostanthren Olive Green B	Chem
2524	CI Vat Green 7	
	add Vat Olive C2G	Pol
2531	CI Vat Brown 1	
	add Ostanthren Brown BR	Chem
2533	CI Vat Brown 5	
	add Helanthrene Brown RD	Pol
2541	CI Vat Brown 25	
	add Ostanthren Reddish Brown 5RF	Chem
2548	CI Vat Brown 44	
	add Helanthrene Brown GR	Pol
2554	CI Vat Black 8	
	add Ostanthren Grey M	Chem
2560	CI Vat Black 25	
	add Romantrene Olive FT	Acna
2561	CI Vat Black 27	
	add Ostanthren Olive R	Chem
2562	CI Vat Black 29	
	add Romantrene Grey FBG	Acna
2571	CI Azoic Diazo Component 1	
	add Fast Bordeaux GP Base	Chem
	add Naphtoelan Bordeaux GP Base	Pol
2572	CI Azoic Diazo Component 2	
	add Naphtoelan Orange GC Base	Pol
2573	CI Azoic Diazo Component 3	
	add Fast Red SGG Base	Chem
	add Naphtoelan Scarlet GG Base	Pol
2574	CI Azoic Diazo Component 4	
	add Fast Garnet GBC Base	Chem
2575	CI Azoic Diazo Component 5	
	add Fast Red B Base	Chem
	add Naphtoelan Red B Base	Pol

Page	Colour Index Designation	
2577	CI Azoic Diazo Component 7	
	add Naphtoelan Orange R Base	Pol
2578	CI Azoic Diazo Component 8	
	add Fast Red GL Base	Chem
	add Naphtoelan Red GL Base	Pol
2579	CI Azoic Diazo Component 9	
	add Fast Red 3GL spec Base	Chem
	add Naphtoelan Red 3GL Base	Pol
2582	CI Azoic Diazo Component 12	
	add Fast Red SG Base	Chem
	add Naphtoelan Scarlet G Base	Pol
2583	CI Azoic Diazo Component 13	
	add Fast Red SRC Base	Chem
	add Naphtoelan Scarlet RC Base	Pol
2586	CI Azoic Diazo Component 20	
	add Fast Blue BB Base	Chem
2587	CI Azoic Diazo Component 22	
	add Naphtoelan Navy Blue RT Salt	Pol
2592	CI Azoic Diazo Component 32	
	add Fast Red KB Base	Chem
	add Naphtoelan Red KB Base	Pol
2594	CI Azoic Diazo Component 34	
	add Naphtoelan Red RL Base	Pol
2595	CI Azoic Diazo Component 35	
	add Naphtoelan Blue BT Salt	Pol
	add Variamine Blue Salt B	Chem
2598	CI Azoic Diazo Component 38	
	add Naphtoelan Black K Salt	Pol
2601	CI Azoic Diazo Component 41	
	add Naphtoelan Violet B Base	Pol
2602	CI Azoic Diazo Component 42	
	add Fast Red ITR Base	Chem
	add Naphtoelan Red JTR Base	Pol
2604	CI Azoic Diazo Component 44	
	add Fast Yellow OC Base	Acna
	add Fast Yellow OC Salt	Acna
	add Naphtoelan Yellow CG Base	Pol
2613	CI Azoic Coupling Component 2	
	add Ultrazol I-AS	Chem
2614	CI Azoic Coupling Component 4	
	add Ultrazol VII-BO	Chem
	CI Azoic Coupling Component 5	
	add Ultrazol G	Chem
2616	CI Azoic Coupling Component 12	
	add Ultrazol IX-ITR	Chem
2618	CI Azoic Coupling Component 17	
	add Ultrazol IV-BS	Chem
	CI Azoic Coupling Component 18	
	add Ultrazol D	Chem
2629	CI Azoic Yellow 1	
	add Citazolo Yellow NG	Acna
2641	CI Azoic Red 1	
	add Citazolo Scarlet NR	Acna
	CI Azoic Red 2	
	add Citazolo Red NR	Acna
2642	CI Azoic Red 6	
	add Citazolo Red NG	Acna
2649	CI Azoic Red 29	
	add Citazolo Scarlet N3R	Acna
2662	CI Azoic Blue 6	
	add Citazolo Blue NB	Acna
2683	CI Oxidation Base 2	
	add Futramine Grey B	Pol
2684	CI Oxidation Base 3	
	add Printing Black A	Pol
2685	CI Oxidation Base 6	
	add Benzofur P	Chem
	add Futramine P	Pol

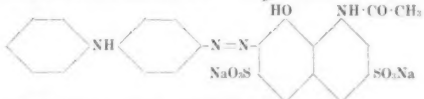
Page	Colour Index Designation	
2687	CI Oxidation Base 10	
	add Benzofur D	Chem
	add Futramine D	Pol
2688	CI Oxidation Base 13A	
	add Renal Brown SO	Acna
2690	CI Oxidation Base 17	
	add Benzofur GG	Chem
2691	CI Oxidation Base 20	
	add Benzofur MT	Chem
2696	Oxidation Bases—Mixtures of Known Constitution	
	add Benzofur MZ	Chem
	CI 76060 + CI 76505	
2703	CI Pigment Yellow 1	
	add Segnale Light Yellow AG, GM	Acna
	add Versal Yellow G	Chem
2704	CI Pigment Yellow 3	
	add Versal Yellow 10G	Chem
2705	CI Pigment Yellow 5	
	add Versal Yellow 5G	Chem
2706	CI Pigment Yellow 10	
	add Versal Yellow R	Chem
2707	CI Pigment Yellow 12	
	add Segnale Light Yellow 2GRT	Acna
2708	CI Pigment Yellow 14	
	add Versal Fast Yellow PG	Chem
	CI Pigment Yellow 16	
	add Segnale Light Yellow NCG	Acna
	add Termosolido Yellow GL Supra	Acna
2720	CI Pigment Orange 5	
	add Segnale Light Orange RNG	Acna
	add Versal Orange RNL	Chem
2722	CI Pigment Orange 13	
	add Segnale Light Orange PG	Acna
2725	CI Pigment Red 2	
	add Versal Fast Red F2R	Chem
2726	CI Pigment Red 3	
	add Segnale Light Red 2B, C4R	Acna
	add Segnale Red BR	Acna
	add Versal Scarlet PRNL, RNL	Chem
2727	CI Pigment Red 4	
	add Segnale Light Red PRG	Acna
	add Versal Fast Red PR, R	Chem
2728	CI Pigment Red 8	
	add Segnale Light Red 4RS	Acna
	add Versal Fast Red F4R	Chem
	CI Pigment Red 9	
	add Segnale Light Red F2L	Acna
2729	CI Pigment Red 10	
	add Versal Fast Red FRL	Chem
2730	CI Pigment Red 16	
	add Versal Bordeaux F3R	Chem
2741	CI Pigment Red 49	
	under "Calcium lake"	
	add Segnale Bordeaux RD	Acna
	add Segnale Red RC	Acna
	for Lake Red RCKK	Pol
	read Lake Red RCKX	Pol
	under "Barium lake"	
	add Segnale Red RB	Acna
	for Lake Red RBKK	Pol
	read Lake Red RBKX	Pol
2743	CI Pigment Red 53	
	under "Barium lake"	
	add Segnale Red LCB, LCG	Acna
2744	CI Pigment Red 54	
	add Segnale Light Bordeaux 2BL	Acna
	add Versal Bordeaux BL	Chem

Page	Colour Index Designation	
2745	CI Pigment Red 57	
	add Segnale Rubine BKG	Acna
	add Versal Fast Red PF6R (in rubber) under "Calcium lake"	Chem
	add Versal Fast Red F6R	Chem
	add Versal Rubine BNCAE, PBNCAE under "Barium lake"	Chem
	add Versal Rubine BNBA, PBNBA	Chem
2746	CI Pigment Red 58 under "Manganese lake"	
	add Segnale Light Amaranth B Bright	Acna
2747	CI Pigment Red 60 under "Barium lakes"	
	add Versal Scarlet 3BBA	Chem
2773	CI Pigment Blue 15	
	add Segnale Light Turquoise BDS, BF	Acna
	add Versal Blue B, PB, NCB	Chem
	add Vulcol Fast Blue 3G	Acna
2776	CI Pigment Blue 24	
	add Segnale Turquoise Blue PV	Acna
2783	CI Pigment Green 7	
	add Segnale Light Green G	Acna
	add Termosolido Green FG Supra	Acna
	add Versal Green G	Chem
	add Vulcol Fast Green F2G	Acna
	CI Pigment Green 8	
	add Pigment Green BM	Acna
	add Versal Green B, PB	Chem
2795	CI Pigment Black 1	
	add Pigment Black SC	Acna
	add Versal Black CR Supra	Chem
2807	CI Pigment White 19 under Standards after India IS 68; CDC 3 (896)	
	add Kaolin for cosmetic Industry	
2808	CI Pigment White 26 under Standards after India IS 68; CDC 3 (894)	
	add Talc for cosmetic industry	
2817	CI Solvent Yellow 2	
	add Resinol Yellow GR	Chem
2821	CI Solvent Yellow 14	
	add Resinol Orange R	Chem
2822	CI Solvent Yellow 16	
	add Resinol Yellow 3G	Chem
2833	CI Solvent Orange 1	
	add Resinol Orange G	Chem
2843	CI Solvent Red 1	
	add Resinol Red G	Chem
2850	CI Solvent Red 2B	Chem
	add Resinol Red 2B	Chem
2858	CI Solvent Red 49	
	add Rhodamine B Base	Acna
2869	CI Solvent Violet 8	
	add Methyl Violet 2B Base	Acna
2871	CI Solvent Violet 14	
	add Alizarine Violet A Base	Acna
2874	CI Solvent Blue 4	
	add Victoria Blue B Base	Acna
2891	CI Solvent Brown 1 under "Note"	
	add Resinol Brown RRN	Chem
	CI Solvent Brown 3	
	add Resinol Brown R	Chem
2892	CI Solvent Brown 5	
	add Resinol Brown 2B	Chem
2900	CI Solvent Black 5	
	add Brilliant Black LB	Chem
2901	CI Solvent Black 7	
	add Nigrosine G Base	Chem
2914	CI Fluorescent Brightening Agent 30	
	add Citalba R conc	Acna
2925	CI Developer 1	
	add Azogen Developer C	Chem
2926	CI Developer 5	
	add Azogen Developer A	Chem
2927	CI Developer 8	
	add Developer ON	Chem
2928	CI Developer 14	
	add Azogen Developer H	Chem
2931	CI Reducing Agent 2	
	add Hydrosulphite SC	SIDS
2932	CI Reducing Agent 3	
	add Hydrosulphite SCW	SIDS
	CI Reducing Agent 4	
	add Hydrosulphite SZ	SIDS
	CI Reducing Agent 5	
	add Hydrosulphite SCL	SIDS
	CI Reducing Agent 6	
	add Hydrosulphite SZS	SIDS
2933	CI Reducing Agent 9	
	add Hydrosulphite SAZA	SIDS

VOLUME 3
Amendments

PREAMBLE TO PART II——In the last sentence of the first paragraph, for (*) *read* (★), and in the third line of the next page for (indicated by *) *read* (indicated by ★).

Page		
3105	*add* 18058 Acid Blue 174 Disoverer	Pol



N-Phenyl-*p*-phenylenediamine→ *N*-Acetyl H acid

3139	*under* 21135	
	add A pigment of this constitution is now commercially available as	
	Versal Fast Yellow PR	Chem
3325	*under* 37245	
	add Diazo components of this constitution are now available as	
	Fast Black B Base	Acna
	Fast Black B Salt	Acna
3572	*under* 74260	
	for (3) Convert tetrachlorophthalic anhydride to hexachloro copper phthalocyanine—	
	read (3) Convert tetrachlorophthalic anhydride to hexadecachloro copper phthalocyanine—	
3604	*under* 77004	
	under Standards after India IS 68; CDC 3 (896)	
	add Kaolin for cosmetic industry	

VOLUME 4
COMMERCIAL NAMES INDEX

Amendments

Page

4001 *add* Chem Chemapol, Prague, Czechoslovakia

4005 *add* Chemapol, Prague, Checoslovakia (Chem)

4421 *beneath* Rutin
add Rylux ..... Chem
Fluorescent Brightening Agents

4466 *beneath* Texan Red Toner D
add Texiprint ..... Scott Bader & Co Ltd
Wollaston, Wellingborough
Northants, England
Pigment dispensions

4491 *beneath* Yeast Black
for Yeast 27175N Specially Pure
read Yellow 27175N Specially Pure
ie, the following 36 items should be preceded by "Yellow", and not "Yeast".

4555 *in* 1010 under CI Acid Yellow 17
delete add Fast Acid Yellow 2G ..... Pol

4560 *delete* 1591 under CI Mordant Black 13 *add* Acid Chrome Navy Blue B ..... Pol

4577
in 3142 under 21540
for Diazo Black BW ..... Pol
read Diazol Black BW ..... Pol

ACTIVITIES OF THE LOCAL SECTIONS

Delaware Valley

GUEST speaker at the Delaware Valley Section's December 5th meeting at Kugler's Restaurant, Philadelphia, Pa, was Ernest L Caswell, Laboratory supervisor, Ciba Co, Inc, New York, NY, who discussed "The Application of Fiber-Reactive Dyes to Cotton and Wool". Their fastness properties were illustrated by dyeings made on piece goods and yarn.

Chairman William S Sollenberger presented a check for $75.00 to the Section's Research Committee for placing second in the 1958 Intersectional Contest with its entry, "Solvent Dyeing of Hydrophilic Fibers from an Aqueous Solution". Committee chairman Harold P Landerl accepted the check on behalf of the Committee members and expressed his appreciation to those who made the Award possible.

President-elect Weldon G Helmus, acting in the capacity of vice president, Central Atlantic Region, presented certificates recognizing their services as former chairmen of AATCC Research Committees to George M Gantz, Committee on Bleaching, and G A Slowinske, Committee on Water Resistance of Fabrics.

The following officers for 1959 were installed: *Chairman*—L Kevin McChesney, Leatex Chemical Co; *Vice chairman*—Clarence A Seibert, Scholler Bros, Inc; *Treasurer*—Edward G Haack, General Dyestuff Co; *Secretary*—Ernst W Empting, Verona Dyestuffs; *Sectional Committeemen*—Arthur W Etchells, Hellwig Dyeing Co, Charles N Kuzma Jr, Amalgamated Chemical Co; Samuel H Loper Jr, E I duPont de Nemours & Co, Inc, and John H Davids, Quaker Chemical Products Co; *Councilors*—William H Bertolet III, Laurel Soap Co, Thomas H Hart, Hart Products Corp, Donald W Robinson, Para Chem, Inc, and William S Sollenberger, American Viscose Corp.

* * *

South Central

THE Winter Meeting of the South Central Section was held January 10th at the Hotel Patten, Chattanooga, Tenn, with 100 in attendance.

Speaker at the technical session was J L Scherbarth, Diamond Salt Co, who discussed and demonstrated the chemical differences in the various grades of salt used in the textile industry.

Ernest Clevenger, vice president and director of sales, Corley Mfg Co, Chattanooga, spoke on "Enthusiasm" at the banquet.

RESEARCH COMMITTEE SERVICE CERTIFICATES AWARDED—L to r: G N Gantz, past chairman of the AATCC Committee on Bleaching; Weldon G Helmus, president-elect, AATCC; C T Anderson, vice president-elect, Central Atlantic Region; C A Sylvester, chairman, Technical Committee on Research; G A Slowinske, past chairman of the AATCC Committee on Water Resistance of Fabrics.

Harold P Landerl (left), chairman of the Delaware Valley Section's Research Committee, accepts check for second place finish in the 1958 Intersectional Contest from Section Chairman William S Sollenberger (right). Also in photo are E G Haack, treasurer-elect, and Ernest L Caswell, guest speaker at the December 5th meeting.

Southeastern

APPROXIMATELY 160 members and guests attended the December 6th meeting of the Southeastern Section, which was held at the Atlanta Athletic Club, Atlanta, Ga. Plans for the meeting were handled by Nesbit Johnston and A Kempton Haynes.

National officers were in attendance at the meeting to discuss the activities and objectives of the AATCC. George O Linberg presented his last speech as president of the Association, reviewing past accomplishments and describing work needed in the future. (The text of Mr Linberg's address appeared in the December 29, 1958 issue of *American Dyestuff Reporter*). George P Paine, executive secretary, elucidated the activities of the national organization, describing it as a corporate enterprise. Charles W Dorn, chairman of the Executive Committee on Research, presented information about the Association's activities and aims in research.

Featured speaker of the evening was Henry A Rutherford, head, Dept of Textile Chemistry and director of chemical research, North Carolina State College. His talk, entitled "Nuclear Fission in Textiles," was illustrated by color slides.

A special feature of the meeting was the awarding of plaques to past chairmen of the Section.

William B Griffin received a standing ovation for his outstanding leadership as chairman of the Section in 1957 and 1958.

Seated, l to r: Charles W Dorn, chairman, Executive Committee on Research; Geo O Linberg, president; George P Paine, executive secretary.

Standing, l to r: A Kempton Haynes, Rohm & Haas Co, meeting chairman; William B Griffin, Dexter Chemical Co, retiring chairman; Robert B Hallowell, Coats & Clark, Inc, chairman-elect; and William B Amos, Jefferson Mills, vice chairman elect.

Henry A Rutherford, North Carolina State College, featured speaker

Charles W Dorn, chairman, AATCC Executive Committee on Research

Robert B Hallowell, Coats & Clark Inc, new chairman of the Southeastern Section

AATCC Calendar

COUNCIL, COUNCIL COMMITTEES, RESEARCH COMMITTEES

Jan 28-30 (Hotel McAlpin, New York, NY)
Jan 28—Research Committees
Jan 29—Council Committees, TCR, ECR
Jan 30 (AM)—Council Meeting

May 29, 1959 (Mount Royal Hotel, Montreal, Canada)

NATIONAL CONVENTIONS

Oct 8-10, 1959 (Sheraton Park and Shoreham Hotels, Washington, DC); Oct 6-8, 1960 (Sheraton Hotel, Philadelphia, Pa.); September 28-30, 1961 (Buffalo, NY); 1962 (Southern Region)

HUDSON-MOHAWK SECTION

Mar 27 (Chelsea House, Tribes Hill, NY); May 15 (Ladies night, Albany area); June 26 (Annual outing—Antlers Country Club, Tribes Hill, NY)

MID-WEST SECTION

Feb 14 (Bismarck Hotel, Chicago, Ill); May 2 (Schroeder Hotel, Milwaukee, Wis); June 12-13 (Outing—Brown Lake Resort, Burlington, Wis)

NIAGARA FRONTIER SECTION

Feb 20 (Niagara Falls, Ont); April 4 (Hamilton, Ont—joint meeting with CATCC)

PIEDMONT SECTION

April 10-11 (Robert E Lee Hotel, Winston-Salem, NC); June 5-7 (Outing—Grove Park Inn, Asheville, NC); Sept 25-26 (Barringer Hotel, Charlotte, NC)

SOUTH CENTRAL SECTION

Mar 21, Sept 19 (Hotel Patten, Chattanooga, Tenn); June 26-27 (Outing—Riverside Hotel, Gatlinburg, Tenn)

SOUTHEASTERN SECTION

Feb 21 (Ida Cason Callaway Gardens, Pine Mtn, Ga); April 18 (National Guard Armory, Cedartown, Ga); June 12-14 (Summer Outing—Radium Springs, Ga); Sept 12 (Ida Cason Callaway Gardens, Pine Mtn, Ga); Dec 5 (Atlanta, Ga)

WESTERN NEW ENGLAND SECTION

Jan 23, Mar 6, Apr 17, May 15, June 12, Sept 25, Oct 23, Dec 4

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JANUARY ICTUS
1959

Inter Alia—Inter Nos

P J WOOD

RESOLUTION

As we write, the New Year is not yet here. As you read, the New Year is well on its way. What happened to those resolutions? To hear some people talk, one would think that they regard resolutions as they do the seal on a pack of cigarettes—made to be broken.

Of course, 30 days does not seem a very long time, if you say it quickly ("and if it is not the judge who is saying it" interpolates Elmer); but, when one stops to reflect that 30 days consist of 720 hours of which 240 are spent in bed, then all we have left are 480 hours in which to eat, drink, work and do a spot of something for our fellow man. And we trust that the policy of the majority is not that of an Englishman, who said, "Nivver do owt for nowt; but if tha' ivver duz do owt for nowt, do it fur thi'sen", which being interpreted is "Never do anything for nothing; but if you ever do anything for nothing, do it for yourself".

Says the Weyerhaeuser News, the house organ of the Weyerhaeuser Timber Company, "There's a new ideology on the humanities scene: it replaces 'man's inhumanity to man' with 'man's immunity to man'. Now man simply ignores his brother".

Ignore—overlook—pass by—disregard—omit—slight—neglect, nasty words, eh?

Maybe we made the non-use of these words and their connotation one of our New Year's resolutions. Maybe we intended to approach the "stranger within our gates" with a pleasant smile and a hearty (but not too crushing) handshake, at church, at the club, at the Association meeting, in the anteroom waiting to see some one. And maybe we funked it, when the moment came.

And 30 days, 480 waking hours, 28,000 minutes are gone already.

Despair not, fellow sinner; if your knowledge of mathematics is such that you can successfully and correctly multiply the aforesaid 28,000 minutes by 11, you will find just how many, many minutes there are remaining in the rest of the year wherein to repent, reform and make amends.

Remember the words of Thomas Mann, "Time has no divisions to mark its passage, there is never a thunderstorm or blare of trumpets to anounce the beginning of a new month or year. Even when a new century begins it is only we mortals who ring bells and fire off pistols".

Chronolocically speaking, the actual first day of a new year for each and every one of us is the anniversary of his birthday. That would be a good day on which to make good resolutions too, wouldn't it?

In the meantime, to borrow a phrase from Garry Moore, "Be good to each other!"

FREE HEAT

In reading the account of the building of a new and enlarged bleaching department by what is probably the largest towel manufacturer in the world, we could not help reflecting on the item regarding the matter of inclusion in the equipment of very necessary heat reclaimers.

The magnitude of the savings to be realized by installation of such equipment becomes fully apparent when one reads the statement of the contractor supplying these heat-recovery devices; he says that it will be possible to save heat, that might otherwise go to waste, sufficient to supply the hot water requirements of about 600,000 people or the inhabitants of a city larger than Newark, NJ, for a whole day.

This is the residual heat in effluent water from dyeing, scouring, and bleaching operations that is usually dumped in the nearest brook, branch, stream, river or public sewer.

It makes our blood run cold when we visit some of the poorer dyehouses and see the amount of steam heat being wasted wantonly, all of which could be avoided by

expenditure of very little money in proportion to the benefits to be attained. Steam pipes as naked as on the day they were installed, leaky valves, leaky joints, rinsing water heated away above the necessary temperature for good washing between operations, exhaust pipes from very poor radiators vented directly through the wall into the open air, with the outlet valve left open far too wide for evacuation of the condensed water. And remember, this condensate is the finest distilled water, which, if collected and stored, would provide the best possible solvent for dissolving soaps, desizing agents, and all sorts of chemicals and every type of dyestuff that is water-soluble; and that without the addition of any sequestering agent.

Mother used to say "Wanton waste leads to woeful want", and it is certain that many a one of these poverty-stricken concerns could be rejuvenated and made to yield a good living to its owners, if they would but bestir themselves and avoid waste. In many instances the owners are very capable do-it-yourself individuals who could cover the pipes, readjust the valves and tighten up leaky joints.

Savings accomplished by such measures invested in heat recovery apparatus would supply hot feed water to boilers, hot water to boil-off machines and dyebacks, hot enough water for most rinsing operations, all of which could amount to millions of BTU's per annum (Yes, Elmer, we said millions), that could make the difference between profit and loss, wealth and penury, victory and defeat, Rolls-Royce and Volkswagen.

NEW MOTTO

Had a short letter from Paul Estey the other day in which he ejaculated a novel and original slogan that would serve as a good motto for all sorts and conditions of dyers who are dyeing those good vat colors on any and every species of stock, fiber, yarn or fabric. Here it is:

"Don't get too caustic and keep your hydro dry".

And, talking about Rhode Islanders, we also heard from Jim Stevenson, who has recently been promoted to the important job of president of his company, BDA, and from Elliot Broadbent, in which he reports that he is several times a grandfather, in which respect he has beaten your scribe, who is not even a stepfather.

A nice note from Hans Luttringhaus brought the good news that we have been honored by having had our name put on the mailing list to receive the Hoechst Journal, a triumph of both art and literature.

At a recent seminar of the Textile Research Institute, we are glad to be able to greet Carl Schlatter, formerly of Viscose Corporation, now retired, and looking as if he liked it. The group of small children we remember as members of his family many years ago must be people by this time.

Another notable present at the seminar was Hugo Ehrhardt, whom we miss seeing as often as we were wont to do, since he left Botany and joined Colgate-Palmolive.

It was nice to see Herman Hager at the first meeting of Metropolitan Section AATCC looking hale and hearty and wearing his accustomed pleasant smile. Dr Hager spent several weeks in Europe this summer.

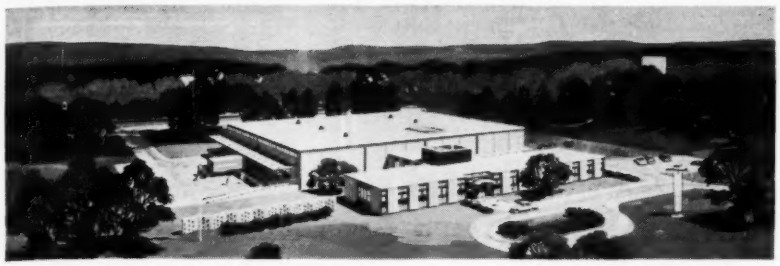
It is an odd coincidence that the learned professor at the above TRI seminar is a colleague and friend of Carl H Brubaker Jr, son of our friend of the same name Sr who was with us. Dr Brubaker is professor of physical chemistry at Michigan State in Lansing. He has just returned from an exchange professorship engagement in Peru, which he survived, back in good shape in spite of the revolution.

PERENNIAL—WASH & WEAR

Our solution of this difficult problem is that it requires some treatment that may be repeatedly washed by hand or by machine—wash-drip-dry, wash-spin-dry, wash-spin-tumble dry, with no creasing, no necessity for ironing, no requirements for special instruction tags.

Remember, these same women who are expected to read these sometimes voluminous directions, are frequently the same ones that fail to read the simple word "STOP" at street intersections, blithely driving through at the statutory speed, or above it, without the slightest vestige of even a genuflection.—Q.E.F.

News of the Trade



Artist's sketch of Geigy Dyestuffs' building now in construction at Charlotte, NC

Geigy Building New Lab-Office-Warehouse in Charlotte

Geigy Dyestuffs, Division of Geigy Chemical Corp, with headquarters in Ardsley, NY, has begun construction on a new one-story 60,000 sq ft structure of modern design in Charlotte, NC, to house offices, laboratory and warehouse. The building is situated on a 13-acre plot on Mount Holly Road facing the new Highway 16.

The project is under the supervision of Frank F Myers of Geigy's Charlotte office. When the building is completed about July 1, Geigy will move from its present quarters on 528 W 11th St, which the company has occupied for many years.

It is reported that newly designed laboratory and pilot plant equipment will be installed in the new building aimed at increasing customer service. Storage facilities will be vastly improved, permitting larger stocks to be carried. The production department will also contain mixing equipment for the standardization of dyestuffs.

The building is of brick, concrete, steel and aluminum construction.

CMRA Meeting to Cover Textile Chemical Markets & Technology

"Textile Chemicals—Markets and Technology" is the subject of the winter meeting of the Chemical Market Research Association, to be held February 18 and 19 at the Dinkler Plaza Hotel, Atlanta, Georgia. Future trends in fabrics and fabric applications and their effects on textile chemical markets will be covered, with particular emphasis given the need for creative product planning in the development of chemicals that can contribute to this future growth.

Speakers scheduled to discuss the segments of the textile chemical market in which they specialize are: Ray L Currier, Columbia Southern Chemical Corp, "Inorganic Chemicals, Their Place and Expected Growth"; W C Caldwell, Wica Chemicals, Inc, "The Role of Organic Chemicals in Textile Finishing"; Carl A Bergman, General Aniline and Film Corp, "Surfactants—Present and Future"; and George O Linberg, Synthron, Inc, "The Textile Finishers' Challenge to the Chemical Industry".

Actual case histories illustrating specific market research and development techniques will be presented by James P Casey, A E Staley Mfg Co, discussing the development of a new starch chemical; and W T Rossiter, Dow-Corning Corp, who will show how market research was used to map the distribution of silicone specialities to the textile industry.

A panel moderated by S D Koonce, American Cyanamid Co, and consisting of George Rieger, Amoco Chemical Co; C W Bendigo, Werner Textile Consultants; John T Fosdick of John T Fosdick Associates; and George Buck, National Cotton Council of America, will evaluate and add their suggestions on the techniques used.

E J Forio, senior vice president of the Coca-Cola Co and president of the Georgia State Chamber of Commerce, featured speaker at the luncheon, will point out the role of market research in business growth.

Tours are planned through Dundee Mills, Fulton Bag & Cotton Mills, and the A French School of Textiles, Georgia Institute of Technology, for Wednesday afternoon, February 18.

Dow to Open Charlotte Sales Office

The Dow Chemical Company will open a sales office in Charlotte, NC, February 2. The new office, the 19th in important cities throughout the country, will be located at 504 Wachovia Bank Building.

T H Caldwell Jr has been appointed manager of the office, moving up from his former post as manager of automotive chemicals sales.

Koppers to Construct New Research Center

Koppers Co, Inc will inaugurate construction of a new Research Center at Monroeville, Pa, in 1959. Site development and initial construction of an adminstration building, three chemical laboratories, a power plant and supporting facilities are programmed to begin in 1959 following the appropriation of funds for this purpose by the Company's Board of Directors.

Construction on the 176-acre tract of land near Pittsburgh, overlooking Route 22 and the Pennsylvania Turnpike is geared to a program of taking care of current needs as well as the continuing growth of Koppers research and development in the foreseeable future. It is expected that Central Research activities will approximately triple within the next 10 years.

As new facilities are completed at Monroeville, certain laboratory activities now carried on at the Verona, Pa, Research Center will be transferred to the new accommodations. Other research involving pilot plants will remain at Verona for the immediate future.

Dr Bachman said that, as each unit of the new Center is completed, personnel to operate it will be transferred. When the administration building is completed activities now carried on at Koppers general headquarters at Pittsburgh also will be transferred there. These include: research administration, technical planning and patent functions.

Exploratory research—research in fields in which Koppers is not presently engaged—has been growing rapidly in the past few years. Approximately 25 percent of the Company's research now is directed toward these new fields.

CCNY Course in Export Marketing of Chemicals

The Evening Division of City College of New York is offering a course in "Applied Export Marketing of Chemicals and Drugs", which will run for 16 weeks from February to May. The instructor, a member of AATCC, is a chemical engineer with many years experience in international trade.

Registration for the course may be accomplished through February 6.

NSP Enlarges Meredosia Plant

National Starch Products Inc has announced plans for a 50% expansion of its vinyl acetate polymerization plant in Meredosia, Ill. Donald D Pascal, president, has stated that the new facilities are scheduled to be in operation by March, 1959. The Meredosia plant, reportedly the largest of its kind in the Midwest, manufactures vinyl emulsions for use, among other applications, in textile finishing resins. The company now has three polymerization plants in operation, and a fourth scheduled for completion in Toronto, Canada, this Spring. In addition to Meredosia, present locations include, Plainfield, NJ, and Slough, Bucks, England.

Mr. Pascal pointed out this will be the second time since the Meredosia plant was built in 1955 that its capacity has been increased to keep pace with the many new and diverse applications being discovered for vinyl copolymers. The first expansion occured in 1956 when the plants's capacity was doubled.

The addition to the Meredosia plant will include co-monomer tanks and handling facilities, a new warehouse, and reactor capacity of 4000 gallons.

National Starch, a major producer of polyvinyl acetate, began research on this product as early as 1939. The company built its first plant in 1946 in Plainfield and since then has produced almost a quarter billion pounds of vinyl copolymer emulsions. Mr Pascal pointed out that technical advances, improved engineering, and increased production had made possible a decrease in the price of the resin from 26½¢ per pound in 1946 to 18¢ in 1958.

50% Increase in LTIRF Contract Work

Contract work amounting to $140,000, shared almost equally by government and industry, was completed by the Lowell Technological Institute Research Foundation in the last six months of 1958, an increase of about 50% over the corresponding period in 1957, according to Dorrance H Goodwin, executive director.

Largest government sponsor were the Air Force Cambridge Research Center and the Quartermaster Research and Engineering Command, the former concerned with an electronics project and the latter with textiles. Textiles were the subject also of the biggest industrial contract, from E I duPont de Nemours & Co, Inc.

Approximately $145,000 in unexpended funds remains in contract with the Foundation.

Using special lighting and a magnetic blackboard, Color Center Director F L Wurzburg Jr (right) discusses color variations of a printer's proof with (from left) Robert Cleary, Alfred Di Bernardo and Dudley Head of Interchemical Corp and Maurice Welt of Crafton Graphic Company, Inc. Switchboard controlling Center's six-stage illumination system can be seen below blackboard.

Interchemical Color Center Provides Headquarters for Research, Service

A central headquarters for basic research, consultation and information in the field of color has been established by Interchemical Corp. The new Color Center serves not only the Interchemical operating divisions but those indirectly allied to their field of interest. Liaison with scientific societies, industry associations and other groups concerned with the use of color will also be maintained.

Director of the Center is F L Wurzburg Jr, who has been associated with color for 25 years. The Center is located at Interchemical's Central Research Laboratories at 432 West 45th St, New York, NY, where existing color facilities have been renovated and improved for the unit.

Basic research will be conducted on improved techniques for color matching and improved methods for establishing color standards and tolerances. In addition, Interchemical's divisions and their customers will be able to consult the Center on basic color theory and its many industrial applications. Similar color information and assistance will be available to advertising agencies, industry associations, and other groups interested in the field of color. A study of color nomenclature is a long-range objective of the Center.

Among the special features of the Center is a unique lighting system that can produce many of the kinds of illumination used in the appraisal of color. Its use with the Center's precise colorimetric instruments is designed to facilitate research and help visitors understand some of the basic principles involved in the science of color.

HTR Bulletin No. 1

In order to simplify and facilitate the ordering of wash tests and accelerate wash tests by the trade, Hatch Textile Research, Inc, 25 E 26th St, New York 10, NY, has sent to its clients its Laboratory Bulletin No. 1, entitled "Accelerated Wash Tests for Colorfastness."

Issuance of the bulletin reportedly is prompted by the confusion among buyers because of misunderstandings and, in some cases, exaggerated claims regarding the so-called "wash and wear" fabrics and garments.

The AATCC has devised classifications for washability which may be used as a medium for properly testing and rating fabrics which pass the standard tests for washability.

The text of the bulletin follows:

"*WASH TESTS:* There are four classifications of washability:

I—105°F
II—120°F
III—160°F
IV—182°F with chlorine.

"Whereas these tests are useful in general for classifying the washfastness properties of dyed fabrics, they *do not* show good correlation with actual consumer use and therefore the AATCC has developed a series of—

"*ACCELERATED WASH TESTS:* In one test, this provides actual color loss that would be experienced in *five* home or commercial launderings. There are three classifications:

II A—120°F
III A—160°F
IV A—160°F with chlorine.

"We strongly recommend that the ACCELERATED WASH TEST be ordered to give test results that will insure consumer acceptance.

"*Note:* These AATCC Tests do not include shrinkage."

British Celanese Expanding Spondon Oil Cracking Plant

The oil cracking plant at the Spondon, Derby, factory of British Celanese is to be expanded by approximately 40% of present capacity. The plant produces ethylene and propylene and from them a wide range of petrochemicals. Work has already begun and completion is expected later this year. The expansion reportedly will incorporate extensive use of automatic control and recording apparatus.

Chemical products other than those based on petroleum are also manufactured on the same site. These, too, are being further developed in accordance with Courtaulds' widening interest in the whole chemical field.

The British Celanese plant, which began operating in 1942, was the first UK plant to produce alcohols and petrochemicals by the cracking process. Previously, UK production of ethanol had been based almost wholly on fermentation of imported molasses.

Research chemists of British Celanese began the work which led to this plant in 1931 after having first established methods of making acetone and acetic acid from alcohols. Acetic acid was imported at that time at high cost from North America. In fact, high raw material costs were retarding the development of acetate in the UK and in Europe as a whole. By 1938, a process for the manufacture both of ethanol and isopropanol and, from these, of acetic acid and acetone had been developed, based on the thermal cracking of oil. Due to the outbreak of war, the process was not put into commercial practice until May 1941 when the British Government gave top priority to this alternative source of alcohols which, being derived from oil, was more secure than the process based on molasses.

The British Celanese cracking process is unique and is said to give a remarkably high yield of useful products, particularly ethylene, propylene and butadiene. It differs in a number of important respects from the American steam-cracking method. The original Celanese plant was designed entirely by the Company's own technical staff. The design of the new additions has been a Courtaulds/Celanese responsibility.

Between 1947 and the present, output from the plant has trebled and the range of petrochemicals has considerably increased. These now include—in addition to acetone and acetic acid—vinyl acetate, hydrocarbon resin, butadiene, ethers and aromatic hydrocarbons, which are being increasingly used for a growing variety of purposes and products, such as detergents, dyestuffs, man-made fibers and textile finishes.

Johnson Calls for Drycleaning Claims Adjustment Code

A claims adjustment code, similar to that employed to determine depreciation values on automobiles for insurance purposes, should be drafted to protect members of the public who have clothing and other materials damaged by drycleaning processes, according to Albert E Johnson, director of trade relations for the National Institute of Drycleaning. In an address to the Canadian Association of Textile Colourists & Chemists, Quebec Section, Mr Johnson called for closer liason between the Canadian and United States textile and drycleaning industries as the means for achieving this goal.

"The question that always arises in damage claims is: What is a garment worth at its terminal point of damage?" said Mr Johnson. "Should it be worth its full replacement value at the end of a period of several years service, notwithstanding the fact that the fabric was found to have failed in some respect or that the cleaner is responsible for the damage?

"What more and more of NID members are beginning to feel is that there should be some kind of agreement among the principal interests involved, including consumer interests, that each general classification of end-use product has a certain life expectancy, be it fashion or useful life, and that adjustments in claims should be made in some relationship to the amount of service the product has made available."

Mr Johnson called for a form of National Claims Adjustment Code, "not unlike those which determine depreciation values on automobiles or in equipment service contracts, which are the basis on which fire claims are paid."

During October, Mr Johnson added, some 2765 damage investigations had been made by the Textile Analysis Advisory Committee of the NID. Of these 31% were attributed to consumer causes, 34% to predamaged fabrics, 16% to faulty drycleaning plant practice, 3% to other materials in the garment and 2% were of unknown origin. The balance of 14% were special problems handled for members.

"Not all drycleaning complaints are brought on by the failure of a fabric to stand up to drycleaning processes", he added. "Certain types of complaints are initiated during periods of wear service. In these cases, drycleaning is like a catalyst. The damage has already started, but the effect of drycleaning conditions brings out the appearance of damage.

"The implications of such problems as we have mentioned here are apparent. They are not the kinds of consumer experience with textiles that are good for the textile industry or for those to whom consumers turn for professional help in the care of clothing.

"There is much to be gained by our respective industries in a closer liaison of our efforts toward the common goal of greater consumer satisfaction in the use of textiles." he said.

Ontario Section, CATCC Sponsors Refresher Course for Dyers

A Refresher Course for Dyers, sponsored by the Ontario Section, CATCC, was recently conducted. The course took the form of double lectures on seven Monday evenings from 7:00 pm to 9:30 pm; the first lecture was on a chemical topic and the second on a dyeing or related topic. An eighth and final meeting was held in the students common room at the Hamilton Institute of Technology where discussion took place on "How can the technical efficiency of the dyeing industry be improved?" and "What modifications would be advisable in the event of a second course being organized?"

The course was generally well received. The main objectives were to broaden knowledge, especially of those dyers whose daily work is normally confined to a narrow aspect of the industry, and to inspire and encourage individuals to seek and understand why certain things are done. An attempt was made to help those who had not had the opportunity to study much chemistry. The meetings brought together a good cross section of people including dyers, suppliers and management, and many informal discussions livened the proceedings.

The lecturers who gave their time and services were D Cooper, H Eastwood, K Geyer, L Lewis, H Lomas, M Mackinnon, J Rowatt, J R Stewart and H Zimmerman. The largest attendance was 52, the smallest was 33 with an average attendance of 44.

A minimum charge was made for the course of eight lectures which made the endeavor a financial success. The council of the Ontario Section of the CATCC, in order to encourage students at the Hamilton Institute of Technology, decided to offer monetary awards to the most deserving chemistry students with the proceeds.

New Safety Award to Warwick's RI Plant

Norman E Alexander, president of Sun Chemical Corp, recently presented Sun's Warwick Chemical Division plant at Wood River Jct, RI, with the firm's Chemical Safety Award for the best safety record and program achieved in 1958 by any of Sun's 38 plants.

Alexander made the award during a personal visit to the Wood River plant during the Division's Open House celebration in honor of Warwick's safety committee.

The Division compiled a safety record of no lost-time accidents since January, 1957, according to H C Whittemore, general manager. "This adds up to a total of more than 250,000 accident-free man-hours since the beginning of 1957," he said.

In presenting the Sun trophy to Joseph Nazaka, Warwick Safety Director, Alexander paid special tribute to the plant's entire safety committee. He made individual awards to each member of Warwick's 12-man safety team.

The Warwick plant has had an outstanding safety history since it moved to its Wood River location from West Warwick 10 years ago. The Division received an award in 1957 from the Liberty Mutual Insurance Co, and General Manager Whittemore is looking forward to receiving an award from the state of Rhode Island in recognition of the plant's safety and good housekeeping achievements during 1958.

Norman E Alexander, president of Sun Chemical Corp (right) presents the Company's Annual Safety Trophy to Joseph Nazaka, chairman of the Warwick Chemical Div Safety Committee.

QM Officials and Contractors Meet to Discuss Army Taupe Raincoat Shade

Sixteen civilian contractors and Army Quartermaster officials met recently at the Military Clothing and Textile Supply Agency, Philadelphia Quartermaster Depot to discuss the color of the Army's new taupe raincoat.

Suppliers present were told of the development of three new dyestuffs which are said to resist color change due to light, and which are reported to be suitable for dyeing the coated nylon cloth used in fabricating the new raincoat. The three dyestuffs are Nylon Special Blue GLF, Nylon Special Orange SLF, and Nylon Special Red 2RWF. The dyes were recently utilized to dye the new Government Standard. It was emphasized at the meeting that use of the three dyestuffs on material for the new raincoat is not mandatory but voluntary.

MCA Sponsoring Pollution Abatement Conference

A major Air and Water Pollution Abatement Conference under the sponsorship of the Manufacturing Chemists' Association will be held at the Netherlands Hilton Hotel, Cincinnati, O, March 17-18.

A conference program is being planned which will be of interest not only to those from industry, but also to representatives of governmental agencies which have interests in pollution problems and their control. Details of the program, being drawn up jointly by the MCA's Air and Water Pollution Abatement committees, will be announced at a later date.

Major MCA-sponsored conferences of this nature previously were held in Houston in April, 1954, and in Washington in April, 1957. In the past several years, the MCA has sponsored a series of regional workshops on air or water pollution in various parts of the country for plant personnel of member companies.

Antique Scenes of the Textile Industry

A group of engravings of the 18th century selected for their contrasting quality as compared with present-day finishing plants as well as for their decorative interest may be seen at the offices of J H Villard, Inc, 175 Fifth Ave, New York 10, NY.

Some of the subjects in the collection deal with dyeing, bleaching, printing and finishing.

Mount Hope Machinery Co representatives, pictured in front of a giant Mount Hope "Free Wheeling" Expander (285" in length, 10½" diameter) at the company's plant in Taunton, Mass. L to r: William M Gallahue, general sales manager; Thomas J Henry, Cleveland, O; Ralph E Blackmar, Providence, R I; Alex A Glod, South America; Robert N Vanderwarker, home office; D A Moran, Watertown, N Y; Walter Dean, home office; Alex Spears, Mobile, Ala; Frank W Preston, home office; Malcolm G Ransley, Sparta, N J; Arnold Bolliger, Hamilton, Ont; P J Murdock Jr, Cumberland, Me; John Robertson Jr, home office; John N Basic, home office; J D Robertson, president; Len Snell, Hamilton, Ont; Paul Brook, Montreal, Que; James F Ginter, Chicago, Ill; Philip Slaughter, Charlotte, N C; Arthur P Sommer, Red Bank, N J; E F Slaughter, Charlotte, N C; Wright Macomson, Greenville, S C; John B Hammett, manager; Fred Wagner, Hamilton, Ont; and S A Moffitt, home office.

Each salesman is holding a 5" Model "Vari-Bow" Roll that can be used to demonstrate to the customer how the "Vari-Bow" works.

A week-long sales meeting, held recently at the newly enlarged home office and plant of Mount Hope Machinery Co in Taunton, Mass served to introduce new products and several new developments in existing products to the Company's American and Canadian salesmen.

Electrical Engineers to Hold 1959 Textile Conference in Atlanta

The Textile Subcommittee of the American Institute of Electrical Engineers will hold its 1959 conference on "Electrical Applications in the Textile Industry" on April 2 and 3 at the Heart of Atlanta Motel, Atlanta, Ga.

The conference, held annually by AIEE, is designed to bring before managers, engineers, technicians and master mechanics of the textile industry information concerning application of new equipment and discussion of operational problems of existing equipment.

Geometric Construction Held Key to Improved Tear Resistance in W&W Fabrics

By varying the geometric construction of certain cotton fabrics it is possible to achieve resin-treated wash-and-wear fabrics with greatly improved tear resistance, E James Stavrakas, Senior Associate at Fabric Research Laboratories, Inc, stated recently at a Textile Research Institute Seminar.

Speaking on December 4 at the fourth of seven TRI seminars in Princeton, NJ, Mr Stavrakas noted the greatly increased interest in tear studies resulting from difficulties with tear encountered after the resin-treatment of cotton fabrics. The emphasis on cotton wash-and-wear fabrics has of necessity caused an emphasis on studies to improve tear resistance, Mr Stavrakas said.

Imperial Changes Corporate Name

Imperial Paper and Color Corp, producer of Imperial Pigment Colors, has changed its corporate name.

At a special stockholders' meeting held January 6th, a new name was adopted—Imperial Color Chemical & Paper Corp. The Company feels that this name change better describes the sales volume relationship of its various manufacturing divisions. It also becomes a more descriptive identification in the expanding chemical industry. Imperial reportedly is the largest manufacturer of chemical pigment colors in the world.

Imperial, which heretofore has had its corporate stock traded over the counter, is now making application for listing on the American Stock Exchange under its new corporate name.

Morningstar Begins Production of Liquid Vinyl Chloride and Latex Compounds in NJ

Production of liquid vinyl chloride and natural and synthetic latex compounds was begun recently at the new Clifton, NJ plant of Morningstar-Paisley in line with an expansion of the company's Latex and Plastisol Sales and Technical Departments. The new, modern plant, which includes 100,000 square feet of manufacturing space, adjoins the company's recently acquired Haberland facility. (Haberland produces drum-dried cold-water-soluble starches for a variety of industries.) Although the Clifton plant will produce the bulk of the plastisol, organosol and latex products in the Morningstar line, production of some of these materials is contemplated at the company's plants in Chicago and Baltimore.

According to Earl C Lenz, sales vp, the new plant is expected to improve service facilities, and allow overnight service to customers. In addition, production of large batch sizes and better control of inventories, especially of raw materials, will provide greater product uniformity, he stated. The production of polyvinyl acetate resin emulsions, also used in the company's adhesive product line, is expected to begin during the spring of 1959.

The latex products being produced at the new Clifton plant are being sold under two tradename designations: Morpalex, a prevulcanized system, for safer handling and improved heat and light stability; and Morpatex, a line of textile latex coating compounds to meet the needs of the upholstery, rug and carpet industry. Special interest is being exhibited in a Morpatex formula used in bonding scrap foam rubbers and synthetic foam fragments into useful, economical molded states for cushioning and packaging purposes.

PTI Participating in "University of the Air"

Philadelphia Textile Institute is participating in the spring semester program of the "University of the Air", WFIL-TV, Channel 6, Philadelphia, which began January 19th and will run through May 27th.

William G Wolfgang, associate professor of chemistry at PTI, is presenting the program entitled "The Development of the Miracle Fibers" on Wednesdays throughout the semester, 9:00 to 9:20 AM.

Young Chemical to Handle Metal Hydrides Sales in South

Young Chemical, Associated, Greensboro, NC, has been appointed sales and service representatives by Metal Hydrides Inc, Beverly, Mass. Young's territory will include the Southern and Southeastern United States.

Headed by Sanford P Young, president, the Young Company will concentrate on the introduction of sodium borohydride and potassium borohydride to the textile industry for the reduction of aldehydes and ketones, reduction of carbonyl in cellulose, reduction of dyes, reduction of disulfide linkage in cystine, reactions with oxidizing agents and reactions to evolve hydrogen and utilize it for expanding plastics.

Huisking Merges Corporate Enterprises

Glyco Chemicals, Clintbrook Chemical Co, and Peder Devold Oil Co have been made operating divisions of Chas L Huisking & Co, Inc, 417 Fifth Avenue, New York, NY, in a merger of affiliated corporations, including its investment corporation.

William W Huisking, who was elected president in the first step in the realignment of the executive personnel, announced the appointment of Chas L Huisking as chairman of the Board, and Eugene McCauliff as vice president. Dr. McCauliff will also serve as president of the Glyco Chemicals Division.

In August, 1958, the assets of Glyco Products Co, Inc were acquired to accelerate the expansion of Huisking's manufacturing program.

Bancroft Establishes Swiss Subsidiary

The establishment of a subsidiary company in Zurich, Switzerland, has been announced by W R MacIntyre, president of the parent firm in America, Joseph Bancroft & Sons Co.

The new company will be known as Joseph Bancroft & Sons Co AG and will have offices at 272 Schaffhauserstrasse. H J E van Heek has been appointed manager of the Bancroft office and Ernest Lueckel has been named assistant manager. Both men are experienced in Bancroft affairs, having most recently been associated in executive capacities with the European office of Craig Advertising Agency.

The new Swiss company will be concerned with all of the various licensing and development activities of the parent firm in Continental Europe.

• NEW PRODUCTS AND DEVELOPMENTS •

Cibanone Navy Blue 2B Dbl Paste

The addition of a new all-purpose navy blue color to the Cibanone Microfined vat dye series has been announced by Ciba Co, Inc. The new dye, Cibanone Navy Blue 2B Dbl Paste, is described as offering level navy shades on cotton and rayon with improved chlorine fastness and minimum water spotting. Ciba states that application flexibility of the dye and its excellent color value permit dyeing economical navies of vat-dyed fastness by pad-steam continuous dyeing and other vat dyeing methods.

Cibanone Navy Blue 2B Dbl Paste dyes a slightly greenish navy shade in light to heavy depths by reduced or pigment methods. Said to be suitable for use with all types of vat dyeing equipment, the dye reportedly can be applied to yarns or piece goods with equal readiness. Its shade properties are said to permit adjustment for production of the full range of commercial navies. With characteristic vat dye fastness, especially very good lightfastness, Navy Blue 2B is an ideal companion dye to reddish vat navies for better shade matching, it is claimed.

According to the manufacturer, the dyeing of dress goods, shirtings, service fabrics and other cotton and rayon goods calls for the shade, application and fastness properties shown by Cibanone Navy Blue 2B Dbl Paste. The dye is said to be particularly interesting in heavy depths. With its slightly greenish cast, the dye reportedly complements the reddish tone exhibited by most vat dyes of this class.

Lumatex Brilliant Red BB Lumatex Brown R

Recent additions to Putnam Chemical Corp's water-phase Lumatex pigment system, for use in printing and pigment padding, include the following:

Lumatex Brilliant Red BB, a very brilliant red, which reportedly is rated to light as 7 in dark and medium shades and as 6-7 in light pinks. In addition to the product's excellent fastness to light, its resistance to perchlorethylene is also said to be very good.

Lumatex Brown R, a neutral brown shade, is said to have outstanding fastness in dark shades as well as tans and very good fastness to perchlorethylene.

Yarn Analyzer

Yarn Analyzer

The Yarn Analyzer (copyright 1958) is a "circular slide rule" designed to afford the user a handy aid in selecting the proper yarns to meet a manufacturer's need.

The outer dial lists the more important properties—dye characteristics; crease retention; resistance to wrinkles, moths, mildew, heat, sunlight and chemicals; and moisture adsorption at 65% rh, 70°F—plus the "family," ie, the chemical constitution of the fiber.

The inner dial covers the following yarns: acetate, Dacron polyester, Orlon acrylic, Arnel, silk, Dynel, Saran and Velon, rayon, nylon, Acrilan, wool, Darlan and cotton.

To find the properties of a given yarn one looks for the yarn name on the inside dial, then by turning the inner dial one finds the yarn's properties on the outside dial. To find how one specific property compares for all the yarns, one locates this property on the outer dial and follows it down the listing of yarns.

The Analyzer is available from Nicetown Dyeworks. Orthodox & Belgrade Sts, Philadelphia 37, Pa for $2.00.

PVP K-15

PVP K-15, a low-molecular-weight type of polyvinylpyrrolidone, is commercially available for the first time from Antara Chemicals Division of General Aniline & Film Corp. The new product is said to be particularly good as a dispersant to detergent systems, pigment formulations, and cosmetic applications. There are also indications of superior protective colloid action in suspension polymerizations of polyvinyl chloride.

PVP K-15 is a white powder, which has an average molecular weight of 10,000 compared to 40,000 for K-30, 160,000 for K-60, and 360,000 for K-90—the other viscosity grades of PVP marketed by GAF. The polymer is said to be very soluble in many organic solvents as well as in water.

PVP K-15 is of special interest in the fine fabrics field. Controlled Launder-Ometer tests are said to have dramatically demonstrated that low-molecular-weight PVP is superior to other antiredeposition agents in the removal of carbon soil. GAF claims that it offers the most advantages in the washing of synthetic fibers, including nylon, Dacron, and Orlon, which can be rather difficult to launder. Further, it is stated that the polymer acts as a loose color scavenger to prevent color migration from one fabric to another during laundering.

PVP also complexes with dyestuffs, and this property suggests the possibility that dyes can be used as colorants in paints to fill the gaps in the pigment color spectrum.

PVP K-15 is available in bulk quantities as well as smaller packs at an initial commercial price of $1.50 per pound. Price reductions are anticipated with volume production.

Rexolube AC

Rexolube AC, a product of Emkay Chemical Co, Elizabeth, NJ, is designed to eliminate bronzing and streaking of textiles due to faulty nitrite removal following diazotizing. The product is based on sulfamic acid and is said to react with any excess nitrite remaining in the jig during rinsing. In doing so, it reportedly eliminates two or more ends per rinse. Only two to four pounds of the product are required per 100 gallons of rinse water, it is claimed.

It is recommended that the compound be used this way: After diazotizing, rinse one end with cold water overflowing. Treat the goods by running one end through the bath containing the new sulfamic formulation in the proportions stated above. It is stated that this will cause a complete reaction with all nitrite present.

Rinse time savings of up to two-thirds are made possible by this new process, it is claimed.

The product is available in 300-pound, nonreturnable, fiber drums. Sulfamic acid, mainstay of the formulation, is produced in dry, crystalline form. As such, it is said to be practically harmless to dry skin and to minimize safety and storage problems. No special clothing or equipment is needed for handling.

New Products by Ecco

Complete data and information on properties, application, and use are available on several new products recently introduced to the trade by Eastern Color & Chemical Co, 35 Livingston St, Providence 4, RI.

Dacrol 506, a new Dacron dyeing assistant, is described as greatly superior in evenness and nonspotty dyeing to others in the nontoxic group. It is said to be readily dispersible in water and completely nontoxic, having no volatiles to be emanated in any form.

Other Eastern Color products in this area of interest are *Dacrol D,* a conventional assistant and Dacron dye carrier, and *Dacrol MS,* a nontoxic assistant whose performance reportedly has proven to be outstanding in a variety of applications. Dacrol D is said to produce even, bright shades with good penetration and color depth, and excellent stability of the emulsion even at boiling temperatures is said to assure even dyeing and no spotting. Self-emulsifying, Dacrol D is described as a cyclic aromatic Dacron dye carrier for use specifically in well-ventilated systems. Since it is a liquid, it is said to be easily handled and added to dyebaths. At all temperatures it is reported to be completely soluble to form stable white emulsions. A particular advantage cited by the makers is that Dacrol D is a "one-package product" complete within itself, no other dyeing assistants being required.

Retarder O-42 has been developed specifically for use in dyeing Orlon Type 42 acrylic fibers with basic dyestuffs. Advantages are said to be significant savings in cost, coupled with level dyeing and superior even color depth. The makers recommend Retarder O-42 for optimum results in dyeing Orlon and blends, in light shades and pastel colors. Its use is said to give retarding and leveling in the dyeing process adequate to assure level, even dyeing with excellent depth of color. Amount of Retarder O-42 to be added to the dyebath depends on and varies with the percentage of dyestuff, the pale shades requiring more Retarder O-42 than the deeper shades. Retarder O-42 is described as a modified water-soluble organic condensate. In appearance it is a clear ruby-colored liquid which yields a clear straw-colored solution in water. Percentage to be added to the dyebath ranges generally from 1.0 to 2.0%.

Gloprint Conc is a new printing extender-binder for aqueous systems developed for easier handling and a more economical operation. A concentrated, high-molecular weight, acrylic polymer, this new product is a smooth, heavy, white paste which is said to be readily soluble in water to afford an aqueous extender-binder paste which is described as ideal for both screen and roller printing. Prints produced from Gloprint Conc, according to the makers, have excellent softness, and outstanding fastness to wash and drycleaning tests, as well as superior fastness to light. In addition, it is said, the fullest color value is obtained together with superior crock resistance. Besides its special applicability to aqueous systems, Gloprint Conc reportedly lends itself to use with the oil-in-water system, therein yielding a slightly softer hand, rapid drying, and superior penetration of heavy materials. A unique feature claimed for the product is that printing pastes may be prepared with or without solvents, as conditions dictate. When solvents are used, up to 20% may be incorporated and a full-bodied, oil-in-water printing paste is still obtained, it is claimed.

Four types of *Metaglo* for binding gold and other metallic powders to fabrics are now in active distribution. Designed for application by screen or roller printing, Metaglo reportedly covers requirements for metallic powder binding on a wide range of fibers and fabrics and is said to excel in application to glass fabrics. Advantages claimed are brilliance, luster, and durable bonding — including durability to washing and drycleaning.

Cellamine Conc and *Cellamine 51-G,* gas-fading inhibitors, are reportedly achieving acceptance through good performance coupled with exceptional economy of application in acetate dyeing.

Sterling Evaporated Salt Dissolver

Improvements in design of International Salt Co's Sterling Evaporated Salt Dissolver, on which patents are pending, are said to permit operation at flow rates 50 percent higher than can be obtained with competitive designs. Made of fiberglass-reinforced polyester, the improved unit has a greater brine-making capacity than previous models.

Optional storage hoppers are custom-designed to provide added dry salt storage capacity. Larger sizes than the standard 36" diameter dissolver are also available.

The new dissolver is said to be corrosion-proof, and it is claimed, never needs paint or maintenance. Because the unit is translucent, the level of the salt brine is visible from any position. Although usually manufactured in reinforced plastic, the dissolver is also available in metal.

Nopco KF-99

A new defoaming agent for use in textile operations has been developed by Nopco Chemical Company. Called Nopco KF-99, the product is said to control foam in dye, size, and scour baths, in bleach and boil-off solutions, and in latex and resin emulsions.

Nopco KF-99 is described as a readily dispersible liquid that is effective in small amounts. It is stated that, in dye processes, such as pad, jig, or package dyeing, only one to four ounces of Nopco KF-99 per 100 gallons of dyebath are required. The product does not affect printing paste viscosities, it is claimed.

Cyana Purifying Finish

Cyana Purifying Finish, which is claimed to be the first durable protection against the formation of body odors on fabrics, was unveiled recently by American Cyanamid Co. Application patents for the new product, which is described as a finish which kills both types of bacteria that actually cause the characteristically unpleasant odor of perspiration, were issued to the company last April.

Cyana Purifying Finish was pioneered on five lines of men's wear, which went on sale in time for the Christmas season. Women's wear applications, which are still in the sampling stage, are expected in time for next summer's active hot-weather months.

In all cases, initial garments are cotton and cotton blends, on which the finish is said to retain its effectiveness through as many as fifty washings. The finish is reported to be equally effective on rayon, linen and all cellulosic fibers and blends. In addition to its durability, the new product is said to be compatible with other finishes, and does not cause any change in hand or color. Chlorine bleach will, however, minimize the effectiveness of the purifying agent. Manufacturers recommend laundering with an oxygen safety bleach.

Plans call for the use of a Cyanamid-supplied hangtag identifying the use of the new finish on a garment, and giving laundering instructions. In addition, Cyanamid's Textile Chemicals Department is requiring strict quality-control agreements from all mills, finishing plants and cutters using the new finish.

With the finish launched in the apparel field, research is now being directed toward the bacteria-killing effect of such finishes on garments that do not actually touch the skin, and on soft goods, such as towels and sheets, other than clothing.

Fragrance-Retentive Compounds

Fragrances with a life of two to five years can be imparted to dyes for textiles and paper with the aid of patented odor-retentive compounds, according to Tyrex Drug & Chemical Corp, 29 Pearl Street, New York 4, NY. Described as saponified derivatives of natural essential perfume oils, the new compounds are said to have the unique feature of combining a relatively low initial emission of the fragrance and an exceptionally long fragrance life.

It is claimed that the new compounds, which are crystalline in structure and very light in color, will not affect the shade of dyestuffs with which they are mixed. They are said to be soluble in all organic solvents and to be completely compatible and miscible with all commonly used dyestuff ingredients. Incorporation in existing dyestuff formulations is said to be a matter of mixing in the proper proportions of the odor-retentive compound; no change in production process is involved.

A wide field of application for dyestuffs incorporating the new compounds is forecasted in the dyeing and printing of upholstery and drapery fabrics, with the odors keyed in the colors or designs of the fabrics.

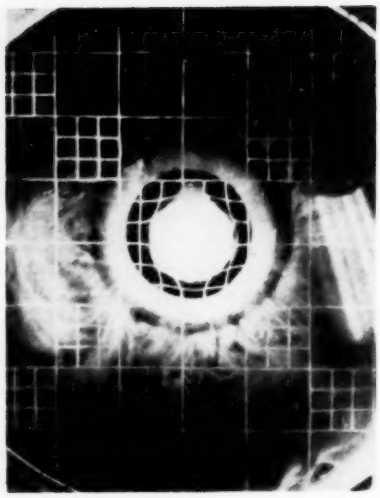
Samples for testing purposes are available to dyestuff manufacturers without charge from Tyrex Drug & Chemical Corp, whose technical staff will work with dyestuff chemists in adapting the new compounds to specific requirements.

Zeset MC

A new thermoreacting resin finish which is said to impart durable crease resistance and dimensional stabilization to cotton and rayon fabrics, with greater resistance to chlorine retention, now is available from Du Pont.

Trademarked Zeset MC, the finish has been developed especially for use on wash-and-wear fabrics. It is claimed that crease resistance and dimensional stabilization obtained with it are reduced only moderately by repeated home launderings or accelerated wash tests starting at the boil.

The hand of fabrics treated with Zeset MC fabric stabilizer can be modified by coapplication of softeners or bodying agents, according to the company's Dyes and Chemicals Division. Use of Avitex K softener with the new product, they point out, not only imparts a desirable hand to treated fabrics but increases their resistance to mussing during laundering and gives a good degree of spot and stain resistance.



Bacteria-free inhibition zone demonstrates bacteriostatic efficiency of Eversan-treated fabrics. Finish was used on the fabric in the Petri dish. It is claimed that, after 50 washings, the fabric is still free of bacteria and there is a bacteria-free inhibition zone immediately around it—even though it is surrounded by a milky field of polluting bacteria *(micr. pyogenes aureus)*.

Eversan

A new bacteriostatic finish for textiles that is said to remain effective for even up to 50 washings has been placed on the market by Ions Exchange and Chemical Corp, 48 Leonard St, New York 13, NY, culminating a seven-year research program to produce a wash-resistant treatment.

Called Eversan, this treatment was developed in an effort to meet increased demand for a "purifying" finish that can resist laundering. It reportedly can be applied to cotton, wool, rayon and a number of synthetic fabrics.

The new finish is said to inhibit the growth of odor-forming and perspiration-decomposing microbes and a broad spectrum of other bacteria by actually fixing a bactericidal metal atom within the cellulosic or keratinic molecule of the textile's own fibers.

Eversan's wash-resistance has been cited on wash-and-wear (or drip-dry) apparel, socks, knitted goods, underwear, handkerchiefs, etc. The new finish is also said to be nontoxic, non-irritating and non-allergy provoking.

A low-cost finish, it is said to improve the hand and other physical qualities of the fabric, thus reducing cost and amount of softener used.

The compounds and the licenses for their use are now available commercially from Ions Exchange and Chemical Corp.

Laurel Adds New Flame Retardants

Two new inorganic flame-retardant chemicals have been developed by Laurel Soap Mfg Co, Inc for use on drapery, upholstery, and certain garment fabrics. The two new products, along with the older Laurel Pyrosan A, an organic flame-retardant, are manufactured as water-clear liquid products readily soluble in water.

All three flame-retardants are recommended by the manufacturer for use on cotton and rayon fabrics. It is reported that they may be applied by any suitable immersing method where controlled pick-up is obtained such as a pad, jig, etc. Nonpermanent compounds (resistant to removal by drycleaning, but not to laundering), they are not suitable for outdoor use subject to the leaching effect of the rain.

Laurel Pyrosan B gives a soft, pleasing hand, it is reported. It is said to be especially useful on pile fabrics and will not crystallize nor settle in storage.

Laurel Flame Retardant 527C is described as low in cost, noncorrosive to equipment, and of high activity. Even low percentages of it used to treat lightly napped goods enable them to pass Federal tests, it is claimed.

For further information, write to Laurel Soap Mfg Co, Inc, Tioga, Thompson & Almond Streets, Philadelphia 34, Pa.

Dow Latex 2582

The Dow Chemical Co has developed a new elastomeric latex based on vinyltoluene and butadiene for use by the textile industry.

Designated Dow Latex 2582, the new product is said to be especially suited for upholstery and rug backing, for modifying and sometimes replacing natural or chloroprene-type latexes in resilient hair padding, and for nonwoven fabric binder and adhesives.

Under development for three years, Latex 2582, according to Dow, has superior resistance to metal staining, is lighter in color, lower in odor, and has improved light stability.

Dow claims great versatility for the new material stemming from stability of the emulsion system used in its manufacture, and the compatability of the vinyltoluene-butadiene copolymer. Dow says the product also is extremely versatile in vulcanization procedures.

A technical bulletin is available from Dow's Midland, Mich, office.

• NAMES IN THE NEWS •

Shelton

Harold G Shelton, formerly director of marketing, has been appointed general manager of the Dyestuff & Chemical Division of General Aniline & Film Corp. He replaces **Philip M Dinkins**, who, as a former vice president of General Aniline and also general manager of this Division, was recently elected to the presidency of the Company, succeeding **John Hilldring**, now chairman of the board and chief executive officer.

Mr Shelton joined General Aniline & Film in 1945 as sales manager of the Antara Chemicals Sales Department of the Dyestuff & Chemical Division. In 1957 he was appointed marketing director of the Division with the responsibility of all sales activities.

Mr Shelton will make his headquarters at 435 Hudson Street, New York, NY, main offices of the Dyestuff & Chemical Division.

Nerney

Becco Chemical Div, Food Machinery and Chemical Corp, Buffalo, NY, has created a new southeastern sales territory comprising the states of Georgia, Alabama, Mississippi, the central part of Tennessee, and northern Florida, and has promoted **Frank Nerney** to be manager of the new territory.

The new territory will be separate from the existing Becco southern sales territory now covered from Charlotte, N C, of which **D Stewart Quern** is manager.

Mr Nerney was appointed technical assistant to the southern sales manager in 1957. He will make his headquarters in Atlanta, Georgia.

James A Stevenson has succeeded **James Ewing** as president of Bradford Dyeing Association, USA, and **Ernest J Chornyei**, formerly a vice president, has been elevated to the executive vice presidency. Both appointments became effective January 1st. Mr Chornyei continues as sales director in New York and Mr Ewing continues as a director. Mr Ewing is also board chairman of Bradford Dyers Association, Ltd, Bradford, England, the parent fim. Mr Stevenson has been with Bradford in a managerial capacity since 1929.

H A R Myers, vice president and treasurer of the Company since 1932, has retired. He is succeeded as treasurer by **Ralph C Tees**, who has also been named a member of the executive committee. Mr Tees is also a director.

H G D Neill has been elected assistant secretary and purchasing officer, and **G A Leonard** becomes chief accountant.

B E Screeton, a director of the parent firm, retired from the board Dec 31.

Lester B Gordon's retirement, effective December 31, as vice president of Solvay Process Division, Allied Chemical Corporation, was announced recently by **I H Munro**, Solvay president.

Mr Munro paid tribute to Mr Gordon for his "long and excellent service with the Company" which spans a period of more than forty years in sales activities.

Mr Gordon first began selling Solvay products in 1915. Ten years later he was appointed manager of the Chicago sales branch and in 1930 he moved to New York as Northern Division Manager.

Named assistant director of sales in 1937, Mr Gordon was subsequently named director and since 1951 has been vice president.

Mr Gordon's duties will be carried on by **Arthur Phillips Jr**, who was recently appointed vice president.

Harry N Lowell has joined the Organic Chemicals sales department, Dewey and Almy Chemical Div, W R Grace & Co. He will assist **Charles E Brookes**, sales manager, in special projects.

Lowell was formerly a member of Dewey and Almy's Marketing Research Department, specializing in organic chemicals.

Medcalf

Eugene C Medcalf has been named manager of the intermediates department of American Cyanamid Co. Mr Medcalf, who assumed his post December 1, has overall responsibility for the marketing of all intermediate products of the company. He will report to **Hugh Puckett**, director of Organic Division sales. His office will be in the department's headquarters at Bound Brook, NJ.

Most recently, Mr Medcalf has been manager of the coal chemicals section of Cyanamid's purchasing department.

Max Birnbaum, manager of Atlantic Chemical Industries, Inc's, Nutley, NJ, plant since 1950, has been promoted to the post of technical director of the firm.

Godfrey

Reed Plastics Corp, manufacturers of thermoplastic materials at Worcester, Mass, has announced the appointment of **George J Godfrey** as technical director. In his new position Mr Godfrey will head up the technical division, directing research and development in compounds for extrusion and injection molding, and will direct the color and control laboratories.

The Koppers Co, in 1955, centralized technical control of the coloring activities of all their plastics coloring plants throughout the world and promoted Mr Godfrey to the newly created position of manager, Chemical Division Color Section.

Mr Godfrey was one of the principal speakers at the Perkin Centennial.

Top management of Royce Chemical Co, Carlton Hill, NJ, has been reorganized.

Albert J Royce Sr, who founded the firm in 1929 and has since served as its president, becomes chairman of the board and chief executive officer. He is succeeded as president by his son, **Albert J Royce Jr,** formerly vice president and treasurer. Another son, **Howard C Royce,** is advanced from vice president in charge of sales to executive vice president.

Hugo Helburn, founder of Apex Chemical Co, Inc, Elizabethport, NJ, celebrated his 100th birthday on Dec 15 at a birthday party attended by members of his family representing four generations.

Still smoking four cigars a day and maintaining an active interest in life, Mr Helburn was a pioneer in the development of the chemical industry in this country catering to the textile and leather fields.

James H Kennedy, formerly director of communications for Bruce Payne & Associates, management consultants, has announced the formation of James H Kennedy & Co, specialists in public relations and direct mail for medium-size businesses. Offices of the new concern are located at Six Old Orchard Rd, Westport, Conn.

Prior to his association with Bruce Payne & Associates, Mr Kennedy had been managing editor of *Textile World.*

Howard Sterne has been appointed staff assistant in the Southeastern Division Headquarters of National Starch Products Inc at Atlanta. In his new position, Mr Sterne, who formerly supervised National's export sales, will assist **Lawrence J Horan,** Division manager.

Lynch

Benny Lynch Jr, formerly sales manager for the Jenkins Metal Shops, Inc, Gastonia, NC, has joined Consolidated Color & Chemical Co, Charlotte, NC, in the same capacity.

Mr Lynch has been contacting all phases of the textile industry throughout the southern territory for the past thirteen years.

Original Bradford Soap Works, Inc, West Warwick, RI, has appointed **Russell H Pearson** assistant sales manager. Mr Pearson joined the company in 1955.

OBITUARY

DONALD G ROGERS, 66, retired president of National Aniline Div, Allied Chemical Corp, December 1958.

Mr Rogers was with Allied Chemical 41 years. He joined General Chemical Co in 1915 as a research chemist and two years later moved to National Aniline & Chemical Co. Within the National Aniline organization, he was named general manager in 1945, vice president in 1947, executive vice president in 1950, and president in 1950.

A graduate of Worcester Polytechnic Institute, Mr Rogers was a member of ACS, AAAS, and the Chemists Club. He held numerous patents in the field of anthraquinone chemicals and dyes.

J P SISLEY, general manager, Institute de Corps Gras (France), September, 1958.

Readers of the Reporter will remember Mr Sisley's articles, the most recent of which appeared in the November 8, 1954 issue under the title, "Sulfonation—Sulfation." Translated from the French by P J Wood, the paper was presented before the Maison de la Chemie in Paris in 1954.

WALTER M SCHWARTZ, honorary chairman of the board of Proctor & Schwartz, Inc, Philadelphia manufacturers of textile machinery and drying equipment, December 19, 1958.

He started work with Proctor & Schwartz in 1896, then called Philadelphia Textile Machinery Company, as an apprentice, later becoming salesman, general manager, vice president, president and chairman of the board, retiring in April, 1958.

During his career with the firm he developed many new machines and held a great number of patents on equipment for the hosiery, textile, tobacco and chemical industries.

In 1943 he was awarded the Industry Medal of the LaSalle College Civic and Social Congress for "distinguished accomplishmets in the cause of social and industrial peace."

He is survived by his wife, Catherine; two sons, P Kay, president of Proctor & Schwartz, Inc, and Walter M Jr, president of Proctor Electric Co; two daughters and a sister.

GEORGE WESCOTT LITTLE, 47, general manager of the Hartsville plant of USF Aspinook Finishing Div, Gera Corp, December 21, 1958.

Mr Little spent his entire working career in the dyeing and finishing industry in New England and the South, starting in 1935 as an apprentice at the Silver Spring Branch of U S Finishing Co, which was headed at that time by Leonard S Little, his father.

A graduate of Brown Univ and Harvard Business School, Mr Little was assigned to the production department of the Norwich branch of U S Finishing in 1937. From 1938 to 1943, he was plant superintendent of the Hartsville, SC branch.

In 1943, he left U S Finishing to join Pacific Mills, where he was superintendent of printing and dyeing in the Lyman Div. Two years later, he rejoined USF as superintendent of finishing at the Norwich branch. He was named general superintendent at Norwich in 1948, resident manager of the Hartsville plant in 1952, and general manager at Hartsville in 1953.

He is survived by his father, Leonard S, now a textile consultant; his widow; two sons; a daughter and a brother.

F L BARRETT, director of the research laboratories of Bleachers' Association Ltd, England, and fellow of The Textile Institute and Society of Dyers & Colourists.

Mr Barrett's work covered a wide field in the dyeing and finishing as well as the bleaching of textiles. He had many friends in the United States as he had visited this country and Canada.

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